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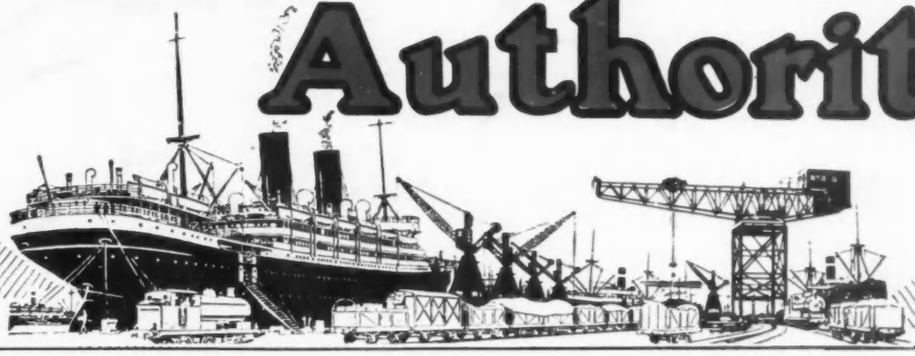

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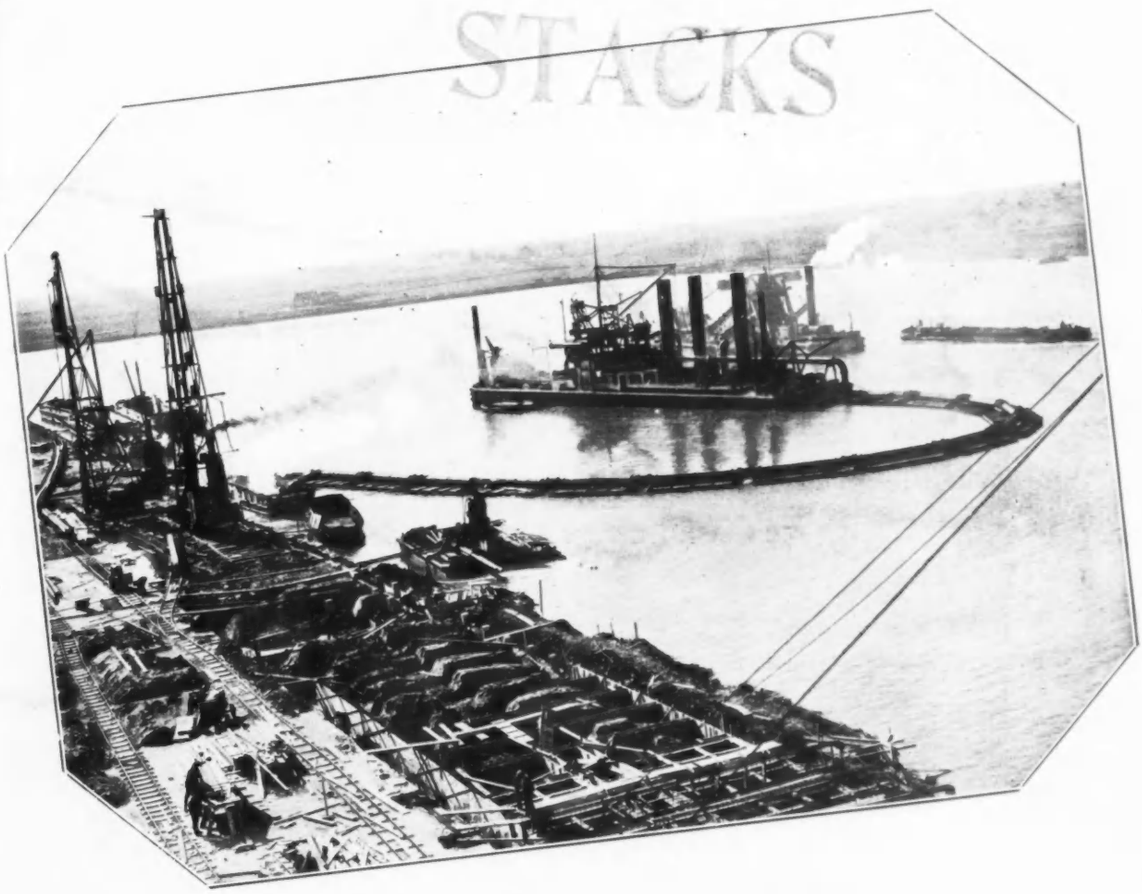

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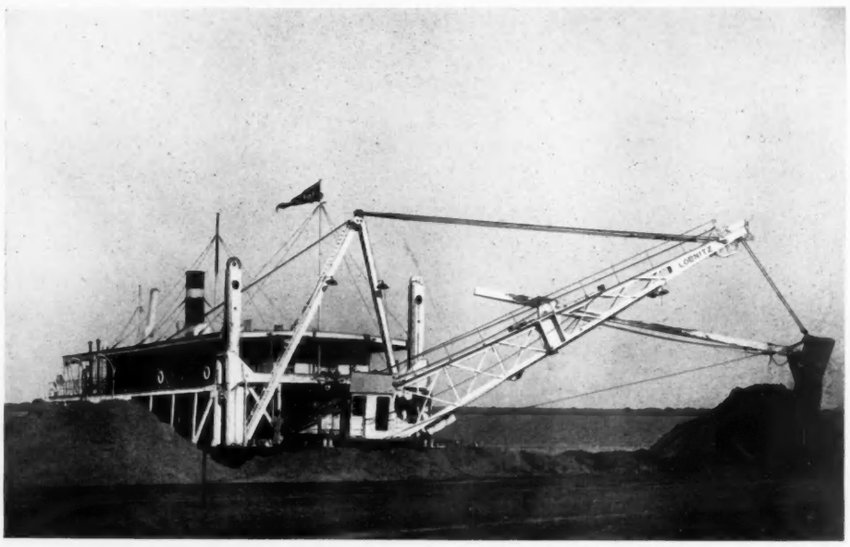

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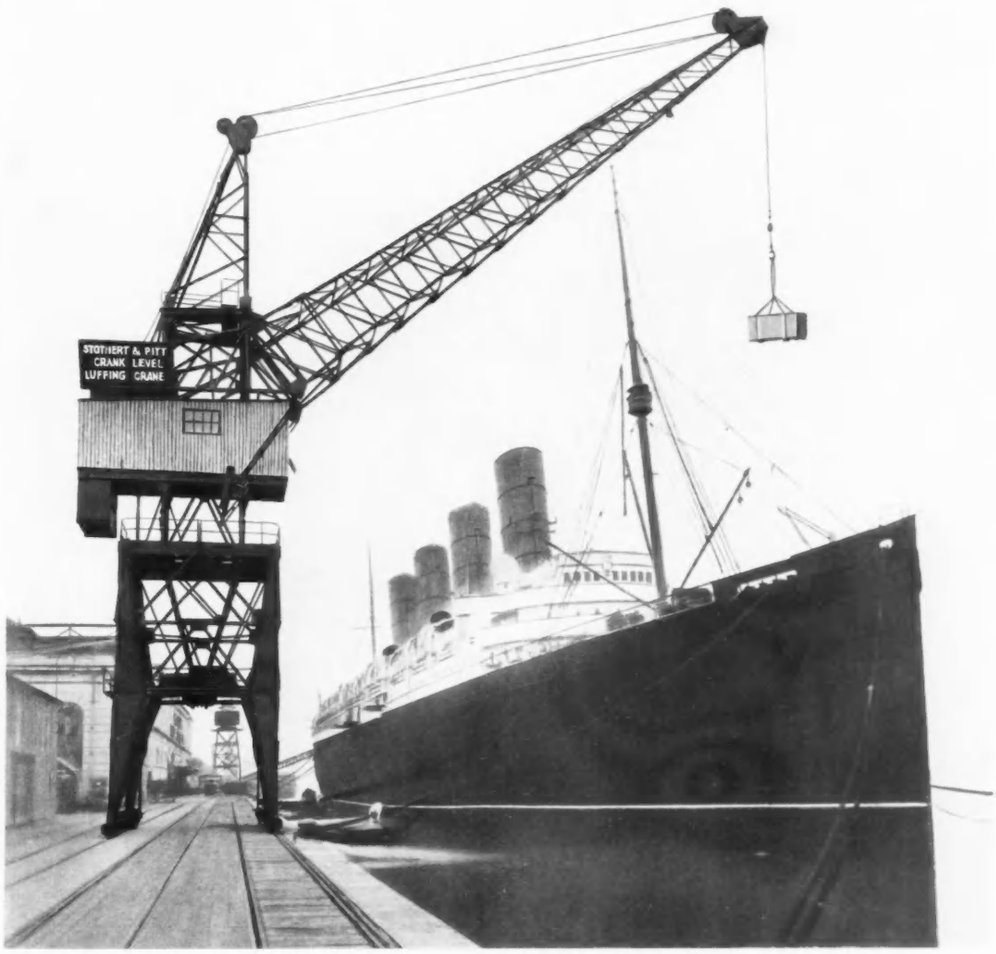

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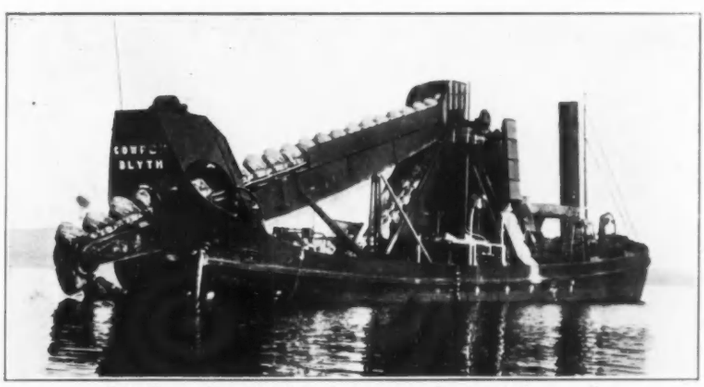

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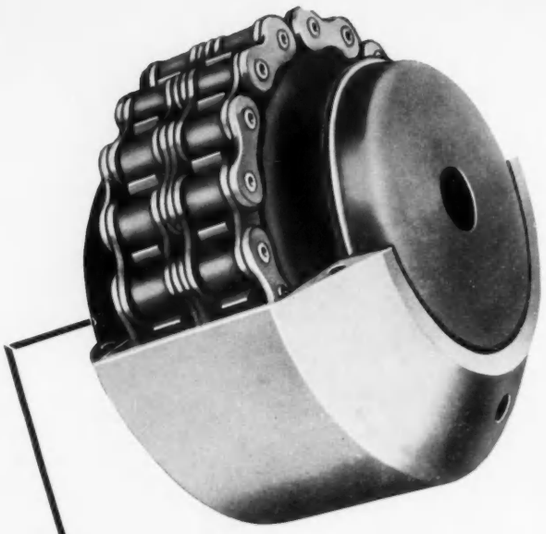

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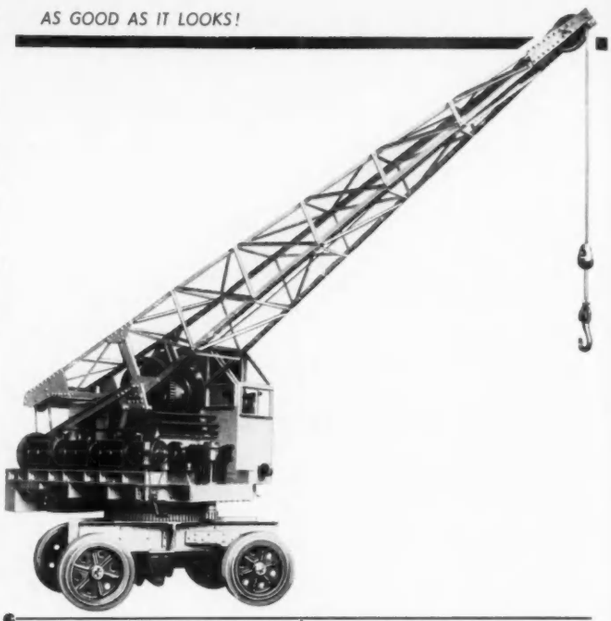

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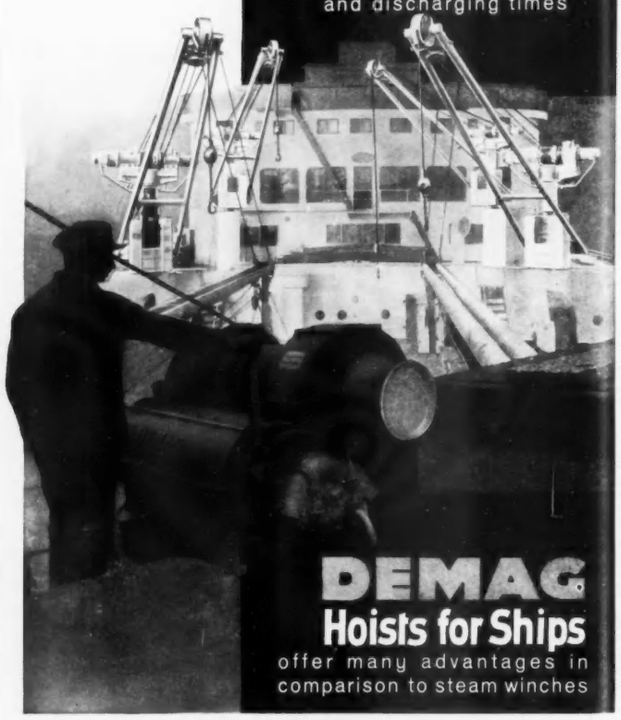

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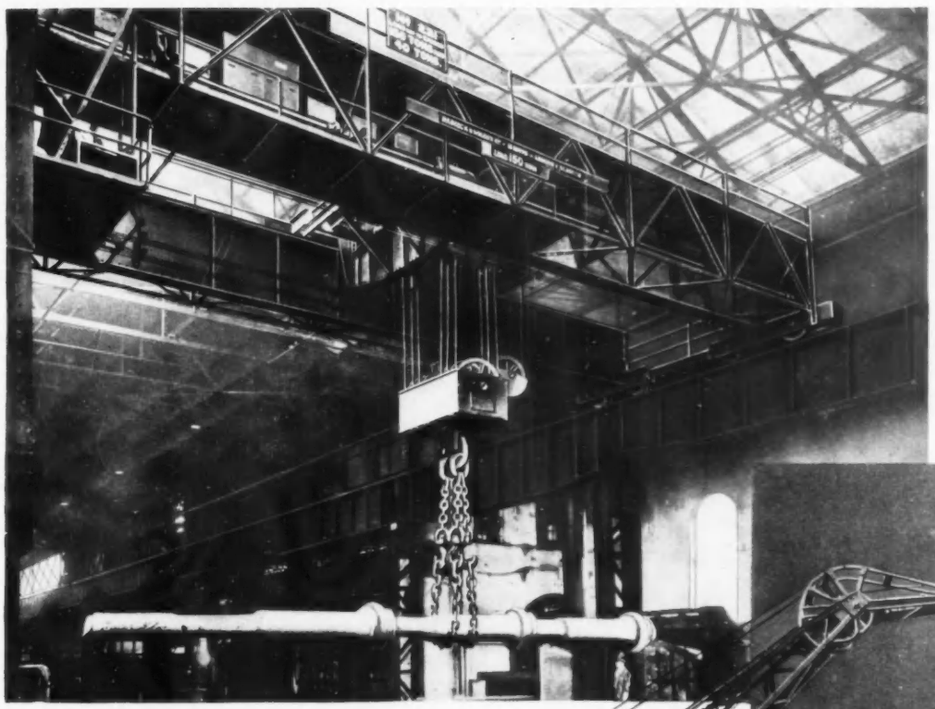

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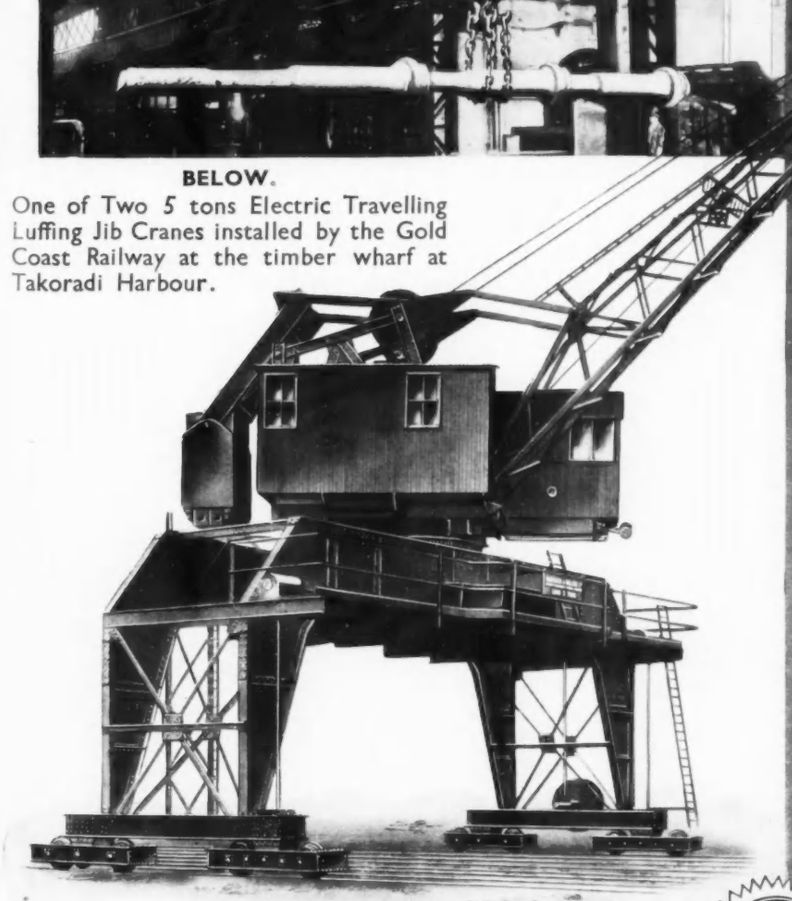

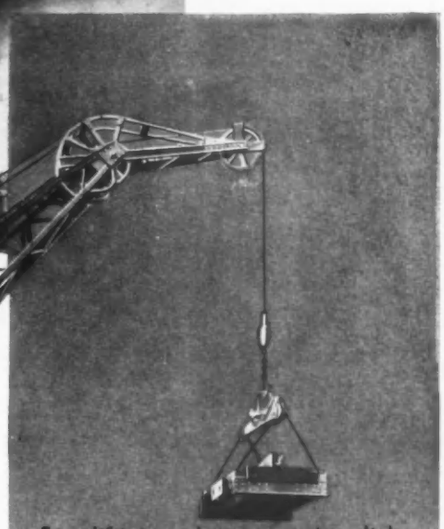

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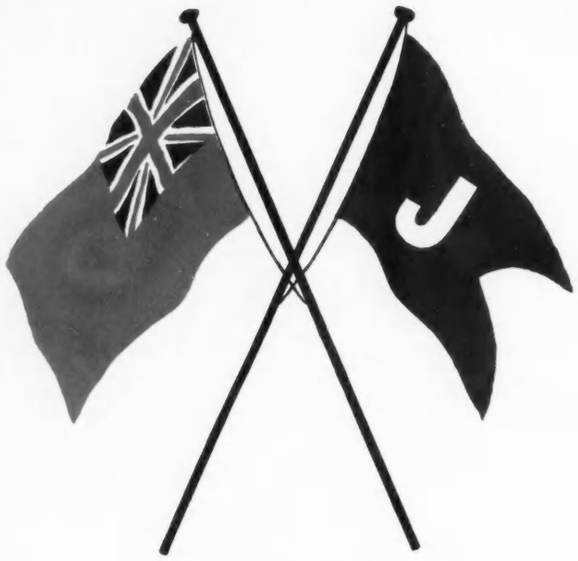

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Contributions which are to be paid for must be clearly marked thus; otherwise they will be considered gratuitous.

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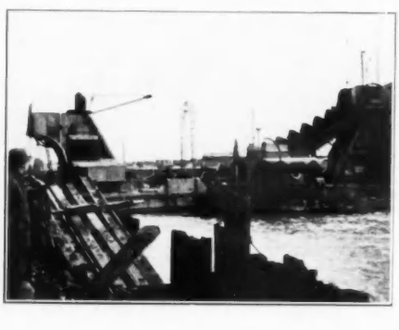

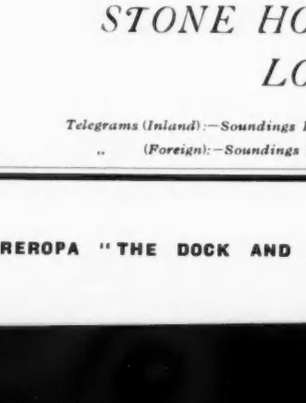

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THE DOCK & HARBOUR AUTHORITY

No. 189. Vol. XVI. JULY, 1936

Editorial

Improvements at Ports of Rosario and Buenos Aires, Argentine.

The Shipping and Harbour Board acting on the instructions of Decree No. 12,145, has submitted to the Government comprehensive plans for the development of the Port of Rosario. In spite of its important geographical position, its increasing passenger traffic, and its growing importance as the port of the second town of the Argentine, Rosario does not yet possess sufficient harbour accommodation, and the expansion which is expected in the near future in the volume of overseas shipping using the port will render the problem all the more acute. It is therefore intended to enlarge the harbour basin, and in particular to provide an outer roadstead which will serve to relieve congestion in the harbour during busy periods. With this object the south mole is to be reconstructed, while a special jetty will be built to serve smaller sea-going vessels. In addition to this, it is planned to erect a four-storey building to meet the needs of passenger traffic. The whole plan will involve an expenditure of 419 million Pesos.

For a long time past the need has been apparent for the provision of a special zone in the harbour of Buenos Aires where vessels with inflammable cargoes could be unloaded without danger to ordinary shipping. Particularly in the case of petroleum and naphtha tankers was such an isolated zone felt to be necessary. Official circles co-operating with private companies have already prepared numerous plans, but the first part of the work was commenced as long ago as 1927, and is now gradually approaching completion. The zone is being constructed on the south side of the South Canal, and the Shipping and Harbour Board will shortly invite tenders for plant to equip at least four of the seven quays it is intended to provide. The oil will be pumped from the separate quays to a storage centre. It is estimated that the complete project will cost 7,360,468 Pesos. The plans provide for the construction of two docks, and an area of about 110 hectares is involved. The docks will also be served by numerous depots and refineries.

Important Extensions to Fish Docks at Grimsby and Hull.

The L.N.E.R. announces that plans have now been approved for important extensions and improvements to their fish docks at Grimsby and Hull upon which work will commence at an early date.

At Grimsby a new quay in re-inforced concrete with a two-storey market, 790 ft. long by 92 ft. 3 ins. wide, will be constructed along the south side of No. 2 fish dock. This new quay will provide berthing accommodation for seven large trawlers from the Iceland deep-sea fishing grounds, together with the necessary facilities for marketing the fish when landed. The scheme involved a number of complex engineering problems including the removal of the existing quay shed and additional railway sidings and road accommodation. In addition, it has also been decided to reconstruct a portion of the market on the south-west quay of No. 2 fish dock, which was destroyed by fire in the winter of 1934. This scheme provides for the complete re-alignment of the quay which will extend the berthing accommodation to provide for three vessels instead of two, and to construct five additional fish kit stores on the upper floor of the market, together with electric lighting and heating. These improvements will very greatly benefit the fish trade of the Port of Grimsby where the deep sea fishing business is increasing substantially.

At Hull, the St. Andrew's Fish Dock is to be further extended westwards to a length of 1,250 ft., giving an increased water area of five acres, making the total water area for the fish docks 23¼ acres. When completed this will be the largest fish dock in Great Britain. The passage between the present St. Andrew's Dock and the existing western extension is to be widened from 35 to 50 ft., and the new extension will be equipped on the north side with a quay 1,000 ft. long and 92 ft. wide. The scheme also provides for five new slipways for hauling trawlers out of the water capable of dealing with the largest trawlers in service. 400 ft. of quay on the south side of the new extension dock is to be provided for the purpose of fitting out trawlers. Incidental to this scheme are many works of some magnitude, including the widening of the roadway behind the fish quay, the construction of a new road by means of an overbridge from St. Andrew's Dock to West Dock Street, which will involve the diversion of the old Hull and Barnsley Railway for a short distance. New sidings are to be provided for the service of the new dock, and the scheme is, perhaps, one of the largest dock schemes undertaken in Hull since the opening of the King George Dock in 1914. These schemes have been formulated under the programme of the Government Assistance Loan.

Proposed Construction of a Dock at Selby, Yorkshire.

A proposal is on foot to construct a dock at Selby, some miles above Hull, and to establish Selby as an official Customs port. At a meeting of the River Ouse Catchment Board it was decided to call the attention of the Board of Trade to the increasing volume of traffic at Selby which, it was stated, is 70 per cent. greater than ten years ago. The Chairman (Alderman R. L. Walker) said that some time, sooner or later, there would have to be a limit to the river traffic that could be accommodated, and he thought it would be necessary to construct a dock. The control of the River Ouse, between the limits of the jurisdiction of the Aire and Calder Navigation and the Linton Dock Commissioners, is vested in the York Corporation as the Ouse Navigation Committee, and covers a distance of approximately 40 miles. There is no obligation to provide wharves or jetties or docks, but one of the jetties at Selby is, as a matter of fact, the property of the Ouse Navigation Committee, who light and buoy the Channel within their jurisdiction and do a certain amount of dredging. Although money is expended in these services, the Committee are in an anomalous position, since they have no power to charge dues on shipping between Hook (just above Goole) and Wharfe Mouth (below Naburn Lock), although the bulk of the traffic on the river causing the alleged congestion, use that stretch of the river and do not come into the area in which light dues are collected by the York Corporation.

The Committee's revenue is derived solely from dues charged on the traffic between Wharfe Mouth and York. Notwithstanding a considerable increase in the river traffic in recent years, the income is only sufficient to meet the expenses of the maintenance of the locks at Naburn, the provision of a dredger and the improvement of the facilities by which the river traffic to York has been developed. The interest of the Ouse Navigation Committee in the construction of a dock at Selby would be to see that the proposals in no way interfered with the free navigation of the river or the safety of vessels engaged on it. As it would be outside the province of the Board of Trade to undertake the provision of a dock, the furtherance of the project would appear to rest in the hands of private enterprise.

A Record Year at Ipswich.

In presenting the accounts of the Ipswich Dock Commission for the year ending 25th March, 1936, to the June quarterly meeting, the Vice-Chairman (Mr. S. Armstrong), in the absence of the Chairman (Mr. Russell Paul), said that the year's business at the port once again constituted a record, and that for the first time the total imports and exports had exceeded a million tons, the precise figure being 1,021,555. There were record imports of maize, motor spirit and wood. £16,600 debentures had been repaid out of income, and it was proposed to repay the balance of the loans under the Ipswich Dock Acts of 1898 and 1904 during the current year. The financial position of the Commission constituted a "very satisfactory state of affairs."

The Strength of the Walls and Floors of Dry Docks

By S. C. BAILEY, Assoc.M.Inst.C.E., F.G.S.

THE increase in the length, and especially the beam and draught of modern ships has necessitated the construction in recent years of longer, wider, and deeper dry docks than have previously been built. The adoption also of a practically rectangular cross section for the main body of the ships, has involved modification in the cross section of the docks to receive them.

Formerly there was usually only a single line of keel blocks, and ships were shored with timber struts at intervals from a number of altars or steps on the faces of the walls of the dock, and from the floor to the bilges of the ship, but in modern docks where there are lines of keel and bilge blocks, there is no need for such shoring, consequently the number of altars can be reduced to a minimum, a few being placed on the upper portions of the walls; these should not be less than 2 feet wide, while the lower parts of the walls are vertical with a few altars at the toes.

The walls of the entrance should have vertical faces for gates, and a batter of 1 in 12 for ship or sliding caissons to enable these to be floated into position on light draught, or removed as required. Steps and ladders should be provided from altar to altar at intervals in the length of the dock, and also from the ground level to the floor with access to the altars. Vertical walls can be used for caissons provided special arrangements are made.

Timber slides from the ground to the floor level of the dock are now scarcely necessary, as the wood required for any scaffolding or rafts to enable work to be done in scraping the sides of the ship while the water is being pumped out of the dock, can be lowered by the cranes on each side of the dock; nor are rudder wells necessary in the floor inside the entrance, as the rudders of vessels can usually be unbolted from the rudder stock and lowered to the floor.

The dock should be wide enough to receive the largest ship that may possibly use it, making due allowance for an increased size of ship in the future, especially as regards the draught. There should be sufficient clear space at the entrance, and also between the walls of the dock to provide light, and to enable air currents to circulate freely, and dry the sides of a recently painted ship, so that the actual docking time and cost may be reduced to a minimum; consequently the floors of docks must be wider than has hitherto been sufficient when ships' bilges were curved from the keel to the water line, and the interior of the docks with numerous altars practically followed the contour of the vessel.

The tops of the keel blocks should be level with, or preferably a few inches above the level of the entrance floor, and the dock floor should be from 4-ft. 6-in. to 5-ft. below that, the blocks being about 5 feet high, to enable men to work under the ship conveniently and provide ventilating space.

The floor should have a fall of about 1 foot in a 1000 feet from the head towards the entrance, and falls of 6 inches from the centre to the drains at the toes of the walls in cross section for drainage purposes. Centrifugal pumps are now generally used for pumping out the dock and for drainage.

For a given depth of dock the cost of construction will increase in direct proportion to the width of the floor, as the cost of the walls will remain the same for various widths.

In cases in which the walls and floor are founded on fairly solid rock, such as granite, limestone, or sandstone and are not subject to hydrostatic pressure, the thickness of the walls and floor may be reduced to a minimum, irrespective of the width of the dock, but even granite is fissured, and in some granite formations there are bedding planes due to consecutive lava flows, while limestone and sandstone formations are faulted, fissured, and have bedding planes in their stratification along which water will pass, and the pressure of this water may not only be due to the head up to H.W.O.S.T. but may even exceed that, should the water originate from hills in the surrounding country.

If such fissures can be successfully plugged and grouted with cement under pressure, there is no reason why the walls and floor should be made any thicker than would be required for solid rock.

If the floor is laid on horizontally stratified limestone or sandstone, which is in layers a few feet thick, and which is liable to hydrostatic pressure, there is danger, unless a sufficient number of holes have been drilled in the rocks for cement grouting purposes, that the grout may not penetrate the seams in the bedding planes sufficiently to seal them; if this is the case, the virtual thickness of the dock floor will be merely increased to an extent that may not be sufficient to withstand the upward water pressure, and it may be necessary to cut out several layers of apparently solid rock before a satisfactory foundation is obtained.

In cases in which the dock is founded on gravel, alluvium, or clay, full hydrostatic pressure up to H.W.O.S.T. at least, against the backs of the walls and under the floor should be provided for when designing the dock.

Even when dealing with clay, a thin film of water is quite liable to creep either from the surface or the sea to the back of the walls and under the floor which will produce according to the head full hydrostatic pressure, because the water will not be able to escape at the same rate as the fall of the tide.

When the floor of the dock is founded on rock that may be subject to water pressure, it is advisable to dovetail the concrete floor into the rock at intervals in the length, the dovetailing being carried out in bands across the floor, these will form barriers to the free passage of water from the entrance or otherwise. Before going into the question of the strength of the walls and floor of a dock there are several points that must be taken into consideration before a design can be prepared, such as the nature of the ground, the maximum safe load it will carry per square foot without settlement, the liability to hydrostatic pressure, the surcharges on the walls and ground at the surface, due to cranes, railways and machinery, the method of construction, and procedure during the progress of the works.

It will be presumed that the necessary borings have been made on the site, and that the surface ground level is about the same as it will be when the dock is completed. If not, the area reclaimed from the sea will required to be dammed off and pumped so dry as possible; this is generally the case. As regards the nature of the ground, if this should be alluvium, which is a mixture of vegetable earth, mud, clay, sand, and gravel usually in layers, through which water can freely percolate, the design of the dock becomes a more difficult matter than if the materials had been solid clay or rock, chiefly because there are so many uncertain factors that have to be taken into account, such as the character of the subsoil, for although this may have been ascertained by borings, these are not always reliable on a large area, and there may be considerable modification in the strata between the borings, which may entail alterations in the design during the construction of the dock; then there are the questions of the natural slope or angle of repose; the angle of rupture and the weight per cubic foot of the soil, the maximum amount of water it will hold, and the maximum load it will carry per square foot without appreciable settlement.

These particulars should, if possible, be obtained by experiment before the dock is designed.

The lateral pressure on the walls of the dock due to the surcharge on the surface of the ground at the back of the walls will have to be taken into consideration. There will be local pressures from cranes, railway goods trains, boilers, turbines, anchors, chain cables, screw propellers, machinery, and even heavy guns, although most of these loads are dealt with in wet docks.

It is advisable if possible to keep all such heavy loads away from the docks walls outside the point at which the line of rupture of the soil cuts the surface of the ground, for then the pressure on the walls from them will be considerably reduced, but in the case of cranes and railway trains it is not possible to do this, so the rail track of the crane which does not bear on the wall should be carried by reinforced concrete beams supported by piles, especially as it will require a considerable time for the ground at the back of the walls to become consolidated.

In any case an assumed general superload of from 5 to 10 cwts. per square foot should be provided for.

The concentrated loads from the wheels of the cranes on the walls will be spread over the wall longitudinally probably at an angle of 45 degrees from the points of contact of the wheels with the rails, so that the distributed load at the base of the walls will not be great, it may not exceed 2 or 3 tons per sq. ft., depending on the type of crane, lifting capacity, and number of wheels.

As regards the construction of the dock, the concrete walls will first be built in deep trenches with heavy timbering and shores, and drainage pumps will require to be constantly kept

The Strength of the Walls and Floors of Dry Docks

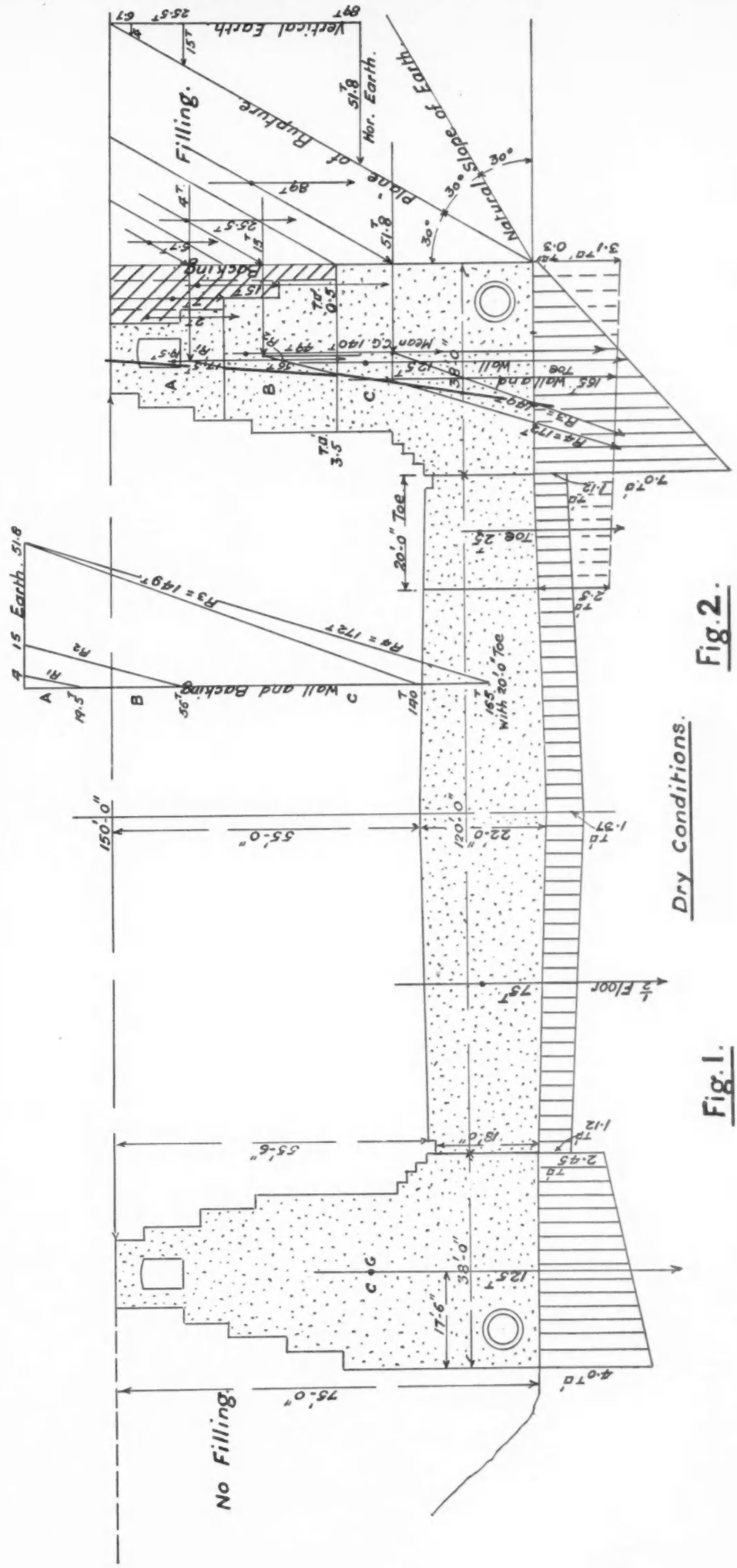

Fig. 1.

Fig. 2.

The Strength of the Walls and Floors of Dry Docks—continued

at work. In some cases the walls are constructed of cellular caissons of concrete, which are weighted with iron or concrete blocks, and sunk into the ground by grabbing out the material of the soil from inside the cells, and when sunk to the required depths, the cells are plugged with strong concrete at the bottom, sufficiently thick to withstand the full hydrostatic pressure, the remainder of the cells may then be filled with a weaker concrete or gravel, and finished at the top with a strong concrete plug. The loads of iron on the caisson should not be removed until this is done, or the caisson may rise under the water pressure notwithstanding the ground friction on the sides, which may not amount to much until the ground has consolidated round the caisson. Caisson walls make heavy substantial structures, capable of withstanding the thrust from the floor of the dock, when under water pressure.

When a section of the walls longitudinally has been constructed, the earth "dumpling" between the walls is removed in sections commencing at the walls on the inside and working towards the centre of the dock; this should be done in trenches at intervals across the floor, leaving a "dumpling" of earth between each section, which is removed so soon as the first floor sections have been concreted. The intermediate sections can then be completed.

During the concreting of the floor, the joints after each day's work should be left in steps both in a longitudinal direction and in cross section to act as bonds, and before beginning work again the concrete steps and faces should be well plastered with cement. The effect of commencing the concreting of the floor at the toes of the walls, is that the walls are given additional stability to resist the pressure of the filling at the back, which is being done while the work on the floor is in progress, but complete filling should not be done to surface ground level, on any section of the work, until the floor has been concreted right across at the particular section, otherwise there will be a tendency for the walls to slide forward. The pressure on the ground at the toes of the walls will be considerable, the concrete of the floor will take some months to set hard, and the walls may lean over towards the dock.

The advantage of building the walls first, is that the maximum load on the ground is under the walls; the soil has therefore time to settle down under the load to a quiescent state before the floor is concreted, thus avoiding any rupture due to shear at the junctions of the floor and the walls, the concrete of the former being still " green " or unset, because of its thickness.

Various theories have been put forward from time to time as to the actual pressures exerted by soils at various depths, but few can be taken as entirely satisfactory for general purposes, because the angles of repose and rupture vary with different soils and conditions, and most of the experiments on which formulae are based are founded on tests made with certain materials such as dry sand, earth, and clay, but it is unusual for dock walls to be founded on these materials alone, and when the soils are damp, or hydrostatic pressure has to be taken into account, it is useless to attempt to base the calculations for the thickness of the walls on any refinement of mathematical formulae.

The wedge theory of the pressure of earth or other soils, on which the strength of most retaining walls is based, appears to be the most satisfactory method of approach to the problem; it has stood the test of practical experience, both as regards the theory, and of walls constructed according to it.

Under the wedge theory the angle of repose of the material is taken, this is the natural angle at which the material will stand in all weathers and conditions; assuming this is 30 degrees, then the complement of this angle and 90° to the back of the wall is bisected, this is 30°, so that the angle of rupture will be 60° from the horizontal—the angle of rupture is the angle at which the material will stand for some considerable time until weathered, and varies with the angle of repose and character of the material, and is usually slightly more than 60° for a natural slope of 30°.

The wedge of earth between the angle of rupture and the back of the wall represents the actual earth pressure on the wall, acting through the centre of gravity of the wedge, the vertical weight having been resolved into its horizontal component, acts at $\frac{1}{3}$ the height of the wall. Another suitable method which gives the same results, is to assume that the earth is a fluid: if the earth weighs 124.4 lbs. per cub. ft. it is treated as a fluid having a weight of 41.2 lbs. per cub. ft. and the calculations are made in the same way as for water pressure. Should the earth weigh 112 lbs. per cub. ft., then the equivalent weight for fluid pressure will be 36.6 lbs. per cub. ft., a reduction of about 33 per cent.

In the accompanying figures, the cross section of a typical modern dry dock is shown, it represents no particular dock, and it is assumed to be 1000 feet long, 150 ft. wide at coping level between the walls, 120 ft. wide on the floor, and 55 ft. deep from coping level to the floor at the centre, having a depth of 50 ft. of water at H.W.O.S.T. on the floor, and 45 ft. on the cill at the entrance which is 130 ft. wide.

For the purpose of the following calculations certain assumptions have been made, viz:—

(1) The material on which the dock is founded is alluvium, the term "earth" being applied to that material and the filling behind the walls. The natural slope has been taken at 30° and the angle of rupture at 60° to the horizontal.

(2) The weight of the alluvium has been taken at 124.4 lbs. per cub. ft. or 18 cub. ft. to the ton, the weight of sea water at 64 lbs. per cub. ft. or 35 cub. ft. per ton, that of the concrete at 140 lbs. per cub. ft. or 16 cub. ft. per ton, while the waterborne stone backing to the walls has been taken at 60 lbs. per cub. ft. or say 37 cub. ft. per ton.

(3) The dock is assumed to be liable to full hydrostatic pressure up to H.W.O.S.T. and the floor is designed sufficiently thick to withstand this pressure.

(4) The safe load on the ground has been taken at 4 tons per sq. ft. The depth is 75 feet, and the normal pressure on the ground at this depth from the earth would be 4.16 tons per sq. ft.

The ground might possibly carry a greater load safely, because probably already a considerable depth of soil has been removed from the surface by denudation during past geological ages.

As regards the question of a thick floor to the dock, capable of resisting the full water pressure underneath, the alternative to this is to construct a thin floor of strong concrete, and perforate it with vertical water vent holes, all over the surface, the holes being 4 inches diam. iron pipes, buried in the concrete, and fitted with flap valves at floor level. This involves constant pumping and a wet floor, but the annual cost of this is so great that it would be cheaper in the long run to build a thick floor.

Another method is to put in a floor reinforced with steel as has been done in the case of a dry dock at Amsterdam (*The Dock and Harbour Authority*, July, 1925). In this case the floor was first constructed and the concrete which was 11 ft. 9 in. thick set in from 4 to 6 weeks.

In the diagram Fig. 1, a cross section of a length of the dock is shown completed, and before filling at the back of the walls has been begun, there is neither earth nor hydrostatic pressures. The danger of doing much filling before the floor is completed on a section of the length, is that the wall may slide forward, as the ground is usually wet and slippery, and soft at the toe of the wall. The weight of the wall per lin. ft. is 125 tons, and the coefficient of friction is 0.3, so that $125 \times 0.3 = 37.5$ tons lateral pressure will be sufficient to push the wall forward if the ground is wet.

Assuming that the concrete in the floor has not hardened sufficiently to assist the wall, the load on the ground under the heel will be 4 tons and under the toe 2.45 tons per sq. ft., while under the floor it will be from 1.12 to 1.37 tons per sq. ft. The ground will safely carry these loads, and the shear on the concrete at the junction of the floor and the wall will be negligible. When the concrete of the floor hardens, the pressure from the wall will be distributed over a portion of the floor, which will act as an extended toe to the wall, and the load on the ground will be reduced. In this case the floor is merely acting as a strut between the walls, without any end loads.

In Fig. 2 the filling at the back of the walls is shown completed, but there is no hydrostatic pressure, the backing, which is usually of rubble stone, has been added to the weight of the wall, this moves the centre of gravity slightly towards the backing, and the weight of the wall and backing totals 140 tons.

The effect of the wedges of earth on each section A, B and C of the wall is shown by the line of thrust in the body of the wall. The result is that the pressure on the ground at the heel of the wall is 0.3 ton per sq. ft. and at the toe 7 tons per sq. ft., assuming no adhesion of the floor concrete to that of the wall. This is 3 tons per sq. ft. more than the ground will stand, and shows the danger of completing the filling at the back of the walls before the floor concrete has had time to thoroughly harden, and so extend the toe of the wall. Such an extension has been assumed to a distance of 20 ft. from the wall, resulting in the pressure at the new toe being reduced to 2.5 tons per sq. ft., while that at the heel is increased to 3.1 tons per sq. ft. This will make the wall stable, and the floor will still act as a strut.

(To be continued).

Notes on Recent Legal Decisions

THE vexatious and trivial nature of the many claims brought against public authorities is well illustrated by the recent action in the Court of Session, *McGonigal v. Granton Harbour, Ltd.*, in which plaintiff sued for £1,500 damages in respect that while cycling over dock roads and railway lines he was thrown to the ground and broke his leg. Lord Wark, in dismissing the case, observed that the road in question was a private road to which the public had no access as of right but only by permission of the defendants. The only duty owed by the defendants to the plaintiff was that owed to a licensee, namely, not to expose him to concealed danger. The accident happened in broad daylight, and the plaintiff had passed over several lines of railway before the crossing at which he fell. The faults alleged were that the rails were not level with the roadway and that there were large pot holes between the rails. While the roadway was in good condition as far as the surface was concerned, it was not a matter of controversy that the surface between the rails was at a lower level than the road outside. The question his Lordship had to determine was whether that condition inferred any breach of duty on the part of the defendants towards the plaintiff. In his opinion it did not. If a cyclist chose to ride along a private road within the precincts of a harbour undertaking and a road crossed every hundred yards or so by a railway line, he must expect or suspect that the lines or ground between them might not be dead level with the surface of the roadway, and take precautions accordingly.

The question litigated between *The Owner of the Motor Boat Wendy* and *The Owner of the Motor Boat Solace*, 181 L.T.I. 193, was really whether the damage sought to be recovered was too remote. The plaintiff alleged that in a narrow channel the defendant's boat had passed him at an excessive speed, causing an excessive wash which upset a paraffin stove on board, occasioning a fire which caused considerable damage. The defence was a denial of excessive speed and an averment that if the stove had overturned that was due to the plaintiff's own negligence in using a stove which was unfixed and left unattended. On evidence the allegation of excessive speed was proved. It was also found that plaintiff's boat was of normal stability, and the stove was stable and not readily liable to be upset. Judgment was given for the plaintiff. In argument, reference was made to *Re Polemis and Co.* (1921) 3 K.B. 560, in support of the doctrine that once negligence is proved it is immaterial whether the wrongdoer could or could not have anticipated the extent and nature of the consequences of his wrongful act. *Clippens Oil Co. v. Edinburgh and District Water Trustees* (1907) A.C. 291, was also cited, and the dictum of Lord Collins quoted that, " the wrongdoer must take his victim *talem qualem*, and if the position of the latter is aggravated because he has not the means of mitigating it, so much the worse for the wrongdoer. He has got to be answerable for the consequences which flow from his tortious act."

In *London and North-Eastern Railway Co. v. County Council of North Riding of Yorkshire*, 53 T.L.R. 260, the Company admitted that by statute they were under obligation to maintain bridges over public highways, but were not liable to maintain and keep in repair the roadway over the bridge and the approaches to it. It was held that in the context of the statute in question, " Bridge " included the highway over it. " The Railways' main argument was founded on the fact that the statute differentiates between the highway and the bridge which carries it, but when the section speaks of the highway these words do not refer to the highway as a structure contrasted with the bridge as a structure. They refer rather to the means of passage provided by the highway. The public in future are to be provided with a bridge as a means of exercising their public right of passage. If the bridge is to be a means of passage, it must as a structure comprise the roadway on it."

Fletcher v. Waterman Shipping Corporation and Spencer and Co. was an action (Court of Session 14th March, 1936) by the widow of a dock labourer who had been fatally injured owing to alleged breach of discharging regulations. Plaintiff has succeeded in obtaining judgment in her favour and the action is left in court to settle liability as between the two defendants. The shipowners argued that the stevedores were in breach of regulation 38 and thereby brought about the accident, and that in the circumstances regulation 37 (a) applied not to them but to the stevedores. The stevedores, on the other hand, maintained that liability rested on the shipowners in respect of their breach of regulation 37 (a).

There was no question that the conditions requisite to these regulations coming into operation existed. The No. 4 'tween deck hatch was accessible to " persons employed," these being defined as persons employed in the "processes." "Processes " in turn were defined as meaning *inter alia* loading, unloading and coaling any ship in any dock. The depth of the hold and the height of the coamings brought the hatch within the terms of the regulations. Further, the hatch was not in use for the passage of goods. The lower hold contained no cargo to be discharged at Glasgow, and the 'tween deck hatch therefore was not and did not require to be used for the purpose of unloading or the passage of goods.

Responsibility rested with the ship for fencing or covering the hatch unless the hatch had been taken over by the stevedores for the purposes of the processes, and his Lordship was of opinion that in the circumstances of the present case the statutory regulations placed on the shipowners the duty of covering the hatch securely and on the stevedores the duty of refraining from unloading until that was done. The cover which gave way was not secured, and accordingly the shipowners were in breach of regulation 37 (a) and the stevedores of regulation 38.

Manchester Ship Canal Traffic.

The approximate monthly traffic receipts of the Manchester Ship Canal Company for the month of May, 1936, amounted to £110,000, this being an increase of £8,021, as compared with the adjusted figures for May, 1935, which were £101,979. The total receipts for the first five months of 1936 were £514,540, this being an increase of £26,474, as compared with the adjusted figures for the corresponding period of 1935, which were £488,066.

The Port of Copenhagen.

The number of ships which entered the Port of Copenhagen during May, 1936, were:—From inland ports, 1,265 steam and motor-ships of 184,243 n.r.t. and fifteen sailing vessels of 3,429 n.r.t. arrived. Shipping arriving from foreign ports amounted to 791 steam and motor-ships of 387,585 n.r.t. and 21 sailing vessels of 5,251 n.r.t. The total of steam and motor-ships and sailing vessels arriving from both inland and foreign ports for May, 1936, amounted to 2,092 vessels of 580,508 n.r.t.

The Port of Ghent.

During the month of May, 1936, 174 vessels with a net registered tonnage of 182,928 entered the Port of Ghent, as compared with 134 vessels of 146,319 n.r.t. during the corresponding month of 1935. This is an increase of 40 vessels and 36,609 n.r.t.

For the first five months of 1936, 885 vessels of 898,642 n.r.t. entered the port, as compared with 727 vessels of 747,700 n.r.t. in the corresponding period of 1935. This is an increase of 158 vessels and 150,942 n.r.t. this year.

The Port of Rotterdam.

The Chamber of Commerce and Industry of Rotterdam has recently issued the statistics concerning the movement of sea-going ships in the New Waterway, and which are as follows: During May, 1936, 987 ships with a net registered tonnage of 1,617,616 entered the Port of Rotterdam, as compared with 936 ships of 1,544,459 n.r.t. during May, 1935. The number of ships entering for the small ports in the environs were 199 of 431,812 n.r.t., as compared with 174 ships of 398,708 n.r.t. in May, 1935.

For the first five months of the year, January to May, 1936, 4,941 ships of 8,091,593 n.r.t. entered the Port of Rotterdam, as compared with 4,538 ships of 7,306,430 n.r.t. in the corresponding period of 1935. The number of ships entering for the small ports in the environs of Rotterdam during the first five months of 1936 were 1,003 of 2,119,365 n.r.t., as compared with 981 ships of 1,982,344 n.r.t. in the corresponding period of 1935.

After deducting the number of ships counted more than once in the different ports, the number of entrances in the month of May, 1936, amounted to 1,136 vessels of 1,873,088 n.r.t., as compared with 1,048 vessels of 1,736,819 n.r.t. in May, 1935. For the first five months of 1936, the total entrances were 5,602 vessels of 9,231,884 n.r.t., as compared with 5,205 vessels of 8,479,530 n.r.t. in the corresponding period of 1935. These figures are for the whole region of the Port of Rotterdam with its environs, comprising the delta formed by the mouths of the Rivers Rhine and Meuse

The harbour dues for sea-going ships calling at Rotterdam have been reduced by 28 per cent. from June 14th.

Aden Port Trust

The following are the returns of shipping using the Port of Aden for the month of April, 1936.

	No.	Tonnage
Merchant Vessels over 200 tons ...	154	663,939
,, ,, under 200 tons ...	4	494
Government Vessels	23	50,439
Dhows	131	5,540
PERIM.		
Merchant Vessels over 200 tons ...	1	4,852

The total value of imports, excluding Government Stores, was Rs.64,49,000/-, as compared with Rs.55,89,000/- for April, 1935, and of exports Rs.36,21,000/-, as compared with Rs.33,04,000/-.

The total value of both imports and exports together was Rs.100,70,000/-, as compared with Rs.88,93,000/- for the corresponding month last year.

Imports during the month were above those for April, 1935, in the case of coffee, gums and resins, hardware, raw hides, seeds, raw skins, white piece-goods, twist and yarn, and unmanufactured tobacco; and below, in the case of grain, pulse and flour, sugar, grey and printed or dyed piece-goods, manufactured tobacco and private treasure.

Exports were above those for April, 1935, in the case of coffee, grain, pulse and flour, raw hides, raw skins, sugar, white and printed or dyed piece-goods, and unmanufactured tobacco; and below, in the case of gums and resins, hardware, seeds, grey piece-goods, twist and yarn, manufactured tobacco, and private treasure.

TRADE OF THE PORT.

Article.	Unit	Imports		Exports	
		Quantity.	Value Rs.	Quantity.	Value Rs.
Coal	Tons	4,501	1,51,932	3	60
Coffee	Cwts.	5,318	1,28,286	7,149	2,32,233
Grain, Pulse and Flour	,,	57,993	3,17,265	56,955	2,62,411
Gums and Resins	,,	5,001	56,975	2,787	67,227
Hardware	—	0	38,089	0	26,406
Hides, raw	No.	4,428	5,331	9,635	19,555
Oil, Fuel	Tons	69,605	16,35,892	11,267	2,45,122
,, Kerosene	Gls.	39,936	25,520	6,392	4,244
,, Petrol	,,	42,422	46,730	0	0
Salt	Tons	0	0	27,390	2,73,900
Seeds	Cwts.	3,356	33,743	918	7,894
Skins, raw	No.	337,256	2,21,610	494,292	4,81,320
Sugar	Cwts.	13,015	67,960	37,303	1,84,339
Textiles—					
Piece Goods, Grey	Yds.	3,543,020	4,61,305	1,825,330	2,33,359
,, ,, White	,,	1,079,361	1,76,475	516,648	84,406
,, ,, Printed or Dyed	,,	1,495,370	2,55,348	1,351,295	2,78,258
Twist and Yarn	Lbs.	162,298	72,150	60,210	29,904
Tobacco, Unmanufactured	,,	2,745,484	4,89,431	647,780	1,07,351
,, Manufactured	,,	50,540	73,161	15,200	11,459
Other Articles	No. of Pkges.	71,738	15,44,450	35,199	6,20,606
Treasure, Private	—	0	6,36,947	0	4,50,910
Total ...	—	—	64,48,600	—	36,20,964

The number of merchant vessels over 200 tons that used the port in April, 1936, was 154, as compared with 145 in the corresponding month last year, and the total tonnage was 664,000, as compared with 625,000.

Excluding coal, salt, fuel oil and Military and Naval Stores and transhipment cargo, the total tonnage of imports in the month was 11,400 and of exports 8,700, as compared with 10,200 and 6,800 respectively for the corresponding month last year.

Canadian Notes

Montreal and Vancouver Ports Active in 1935.

The biggest tonnage in seven years was handled in 1935 at the Port of Montreal, Canada's eastern sea-port metropolis on the St. Lawrence River. Outstanding developments in the harbour were completed during the last year. Total tonnage of import, export and domestic merchandise handled through the port was 11,654,426 tons, the largest for seven years, and an increase of 328,621 over the previous year.

The net registered tonnage was the second highest in the port's history, with 1,058 ocean-going ships, 747 coasting vessels, and 3,920 proceeding to and from inland ports, making a total of 5,725 ships. Export tonnage handled at the port increased slightly, due mainly to larger outward grain shipments, while imports showed a new high record with an increase over 1934 of almost half a million tons.

Seven or eight years ago, Montreal was known primarily as a grain-exporting harbour. In 1928 grain exports amounted to 45 per cent. of the total. In 1935, the situation had altered to the extent that the grain exports were only 10 per cent. of the total tonnage.

The largest single increase in import tonnage was accounted for by foreign corn, but important gains were also realised by anthracite coal, wood pulp, petroleum oil, bituminous coal, gasoline, molasses, crude rubber, etc. Imports of iron ore, manganese ore and sulphur reached considerable totals. The import of vegetable oils was an important new development of the year. These included cocoanut oil, peanut oil and cotton-seed oil.

The ever-growing importance of oil is revealed in the growth in this movement which has taken place during the past ten years. To-day there exists what might be termed almost a separate oil harbour in one section of the Port of Montreal. Several oil-importing and refining companies are located there, each one served by a small industrial wharf piped for the rapid unloading of crude petroleum and gasoline in bulk from the large ocean tankers. Imports of oil into the harbour during the last ten years have grown considerably. In 1935 they reached a total of 2,081,264 tons, compared with 1,109,415 tons in 1930 and 625,382 tons in 1925.

According to the annual statistical report of the Vancouver Merchants' Exchange, Vancouver and other British Columbia ports held their trade volume during 1935. Interesting comparisons taken from their report follow:—

	1934	1935
Foreign Cargo Shipped ...	3,693,617 tons	3,824,906 tons
Grain Shipped	50,781,000 bu.	46,281,873 bu.
Canned Salmon	1,016,703 c/s	1,020,034 c/s
Lumber and Logs	398,776,726 F.B.M.	432,643,049 F.B.M.
B.C. Exports were also up:		
Logs and Lumber	859,464,714 F B M.	853,978,481 F.B.M.
Apples	676,500 boxes	1,029,417 boxes

Canada's External Trade in April.

Imports into Canada in April were valued at $42,223,000, an increase of 15.2 per cent. during the 12 months, and of 21.3 per cent., as compared with the figures for April, 1934.

Exports of Canadian goods were valued at $57,424,000, a gain of 50 per cent. during the two years, and of 21.4 per cent. as compared with April, 1935. Exports to the United Kingdom rose from $12,413,000 to $15,306,000, whilst exports to the United States increased from $25,455,000 to $31,554,000. The principal items in the increased trade were non-ferrous metals and products thereof; wood, wood products and paper.

Total external trade was valued at $100,187,000, an increase of 18.3 per cent., as compared with last year's figures, or an increase of 36.2 per cent., as compared with April, 1934.

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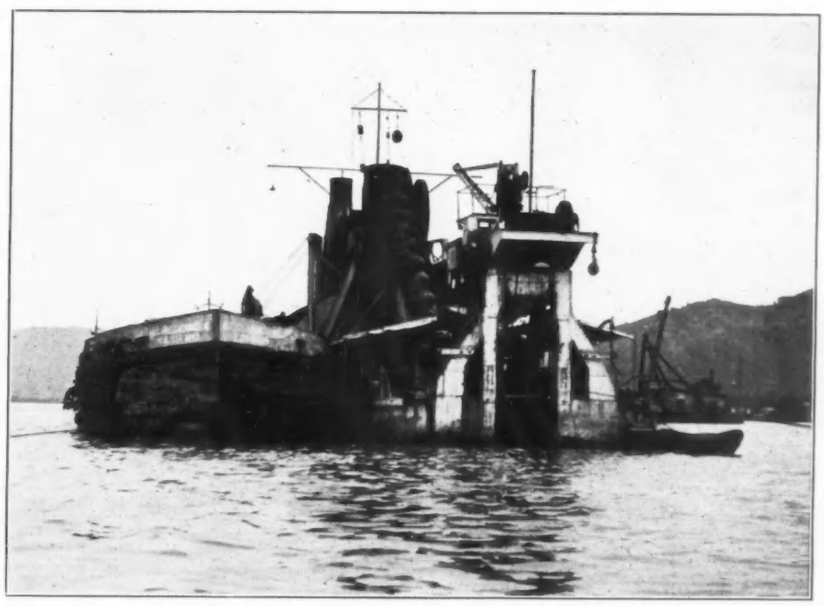

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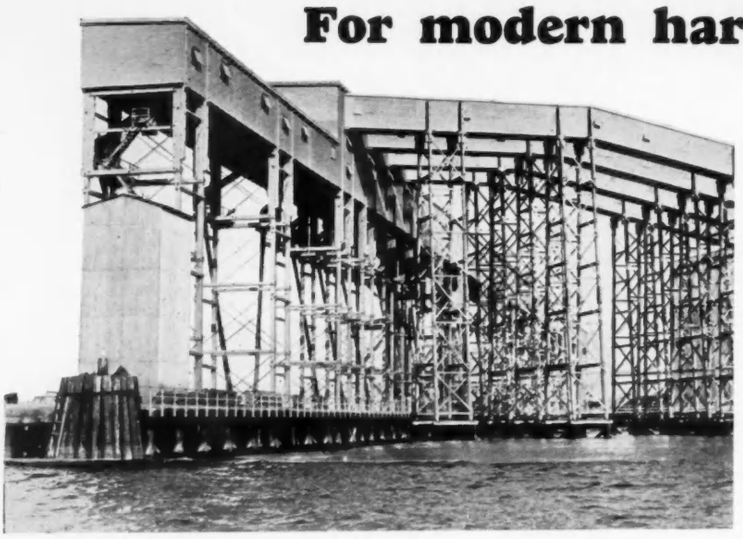

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HAGAN EL FAVOR MENCIONAR EL "DOCK AND HARBOUR AUTHORITY" CUANDO ESCRIBEN A LOS ANUNCIANTES.

North-East Coast Notes

Nearing an End.

WITH the Third Reading of the London and North-Eastern Railway (General Powers) Bill in the House of Commons on May 29th, the fate of Tyne Dock may fairly be said to have been sealed, for the Bill, among other things, gives the Company power to dispose of the Dock to the Tyne Improvement Commission. There is necessarily much to be done before the undertaking actually changes hands, but all this is of a more or less formal character. Earlier in the proceedings when the Bill was before a Select Committee of the House of Commons, it was approved conditionally upon certain amendments being made regarding the protection of employees who might be affected by the change-over.

Royalty to Visit the Tyne.

At a meeting of the Tyne Improvement Commission on May 19th, Sir Arthur Sutherland, the Chairman, announced that the Duchess of York had accepted an invitation to perform the opening ceremony at Jarrow coal staiths on July 28th. This will be the second Royal visit to Tyneside within a few days, for the Duchess of Kent has already agreed to launch H.M. Cruiser "Sheffield" from the Walker shipyard on July 23rd.

In making the announcement, Sir Arthur Sutherland added that adjoining the new staiths there was a stretch of rugged surplus land, from 15 to 18 acres in extent, now being cleared by the Commissioners in order that it might be made attractive for industry. Inquiries for business sites on Tyneside, he said, were coming along in increasing numbers.

Suggested Gateshead Development.

The chairman of the Commission at the meeting already referred to, called attention to the fact that Gateshead Corporation was contemplating the development of the quay frontage east of Hillgate, and were wondering whether the Commissioners, as the Tyne port authority, would be disposed to take a hand in that development. It was not considered, however, to be a scheme to which the Commissioners could commit themselves having regard to all the circumstances.

Mr. H. P. Everett expressed a hope that Gateshead would repeat the application later. If this were done he, for one, would support it, believing that there should be quays on both sides of the river. It was simply because the Commission had so much in hand now that they had turned it down on the present occasion.

Work on the lengthening of two of the dry docks of Messrs. Smith's Dock Co., North Shields, has commenced, but while operations are in progress business will be carried on as usual. The contractors are Messrs. J. G. Thompson, of South Shields. The present length of the docks is 470 ft. with 66 ft. 6 in. beam, and although the lengthening is comparatively small, it means that each of the three docks of the company will be capable of accommodating oil tankers from 15,000 to 17,500 tons deadweight.

Tyne Trade Figures.

Councillor R. S. Dalgliesh, submitting the report of the Docks and Trade Committee at the Tyne Commission's May meeting, said that in coal and coke shipments, April had proved to be a rather disappointing month as they had to record a decrease of 59,000 tons compared with April of last year. The decrease for four months was 80,000 tons, but May had been better and up to the 16th May, 33,000 tons of the decrease had been cleared off. Bunker figures were more pleasing. In March there was an increase of 10,000 tons, and in April 22,000 tons, but there had been a decrease in shipments to foreign coaling stations. Imports of general merchandise were up on last year, the principal increases being in iron ore, timber and steel manufactures, while in exports there were decreases in sulphate of ammonia, tar, pitch and resin.

Mr. Richard Aughton, general manager of the Tyne Improvement Commission, left the Tyne at the beginning of June on a three weeks' tour of the Scandinavian and Baltic capitals as the Commissioners' trade representative. It was so arranged that he would be in Oslo during the meeting of the Baltic and International Maritime Conference which is to be attended by prominent ship owners of the Continent. "While I shall not attend the conference as I am not a member, it will give me an opportunity of meeting some of the leading men in the shipping industry," Mr. Aughton stated. His itinerary would include Stockholm, Gothenburg and Copenhagen, returning via Esbjerg.

Some Blyth Features.

At the meeting of the Blyth Harbour Commission on May 19th, Mr. R. M. Sutton, chairman, submitted particulars of the coal shipments for the four months ended April 30th, which were as follows:—1936, 2,250,938 tons; 1935, 2,061,496 tons; 1929, 1,780,533 tons. The totals show an increase of 9 per cent. on 1935 and 26 per cent. on 1929.

Good progress is being made with the new dock under construction by the Blyth Harbour Commission. Work on the dock which is situated near the West Staiths at the North side of the river, was begun at the end of 1933. The greater portion of the necessary excavations and quay building has been accomplished and after another 180,000 tons of earth have been excavated the work will be finished. The quay wall, alongside the Cambois Road, for which steel sheet piling was used, is completed, and the two ends of the tidal basin have been finished. All that remains to be done is to remove the portion of land between the existing West Dock and the excavations which have been made. The dock will occupy an area of about five acres and will provide waiting berths for about seven ships.

Sunderland Quay Dues Reduced.

In the hope of attracting more bunkering trade, Sunderland Corporation have reduced the quay dues to 1½d. per net registered ton for either coal or oil. This is a lower charge than that made on the Tyne, and the only port on the North-East Coast where the charge is lower than Blyth.

Sunderland coal and coke shipments for the four months ended April 30th 1936, totalled 1,364,821 tons, compared with 1,284,735 tons in 1935, an increase of 80,086 tons. Other exports totalled 14,069 tons, 551 tons less than in the same period of 1935. For the four months of this year imports reached 76,597 tons, which was 1,676 tons less than in 1935. The chief figures for 1936 for the four months were esparto 9,449 tons, iron ore 9,537 tons, cement 6,018 tons, petroleum 24,035 tons, sundries 10,376 tons and timber 13,020 load's.

Official figures show that the coal and coke shipments from the Hartlepools for the five months totalled 1,369,619 tons, or 50,461 tons less than during the corresponding period of 1935. For the five months the total import of timber was 54,288 loads against 63,524 loads for the corresponding period of 1935.

The Port of Amsterdam

The position of the Port of Amsterdam in regard to number of vessels and tonnage and to goods traffic arrived and sailed, as compared with the corresponding figures of last year, is as follows:—

SEAGOING VESSELS AND TONNAGE.

	ARRIVALS				SAILINGS			
	No.	Per Cent.	N.R.T.	Per Cent.	No.	Per Cent.	N.R.T.	Per Cent.
May 1935 ...	227		323,429		231		344,130	
,, 1936 ...	254		351,879		251		367,739	
	+27	+11·9	+28,450	+8·7	+20	+8·7	+23,609	+6·9
April 1936 ...	228		314,328		227		302,806	
May 1936 ...	254		351,879		251		367,739	
	+26	+11·4	+37,551	+11·9	+24	+10·6	+64,933	+21·4
Jan.-May 1935	1,198		1,818,612		1,198		1,824,367	
,, 1936	1,212		1,741,418		1,210		1,736,861	
	+14	+1·2	−77,194	−4·2	+12	+1·0	−87,806	−4·8

SEAGOING GOODS TRAFFIC.
(In Tons of 1000 Kilos*).

	1 Import	2 Transit incl. in col. 1	3 Export	4 Transit incl. in col. 3	5 Total col. 1 & 3
April 1935	256,160	60,132	129,279	55,006	385,739
,, 1936	252,565	69,107	160,734	81,745	413,299
	−3,895	+8,975	+31,455	+26,739	+27,560
	−1·5%	+14·9%	+24·3%	+48·6%	+7·1%
Mar. 1936	246,657	42,470	152,397	56,825	399,054
April 1936	252,565	69,107	160,734	81,745	413,299
	+5,908	+26,637	+8,337	+24,920	+14,245
	+2·4%	+62·7%	+5·5%	+44·4%	+3·6%
Jan.-April 1935 ...	1,127,446	254,762	586,982	218,199	1,714,428
,, 1936 ...	1,003,731	225,026	623,148	261,803	1,626,879
	−120,715	−29,736	+33,166	+13,604	−87,549
	−10·7%	−11·7%	+5·7%	+5·5%	−5·1%

* These figures have been taken from the monthly statistics of the Central Bureau, The Hague, Holland.

Classified according to flag, the number of vessels which entered the Port of Amsterdam during May was:—Netherlands, 142; Great Britain, 43; German, 19; Swedish, 18; Norwegian, 15; Danish, 7; American, 1; French, 3; Greek, 1; Lettish, 1; Finnish, 1; Polish, 1; Estonian, 1; Portuguese, 1.

Notes from the North

I.O.M. Harbour Works.

WHEN the Isle of Man budget was presented in Tynwald, the Receiver-General moved estimates of the Isle of Man Harbour Board totalling £17,447 for the general maintenance of harbours. He said that it was proposed to employ 71 men from the unemployment register, as against 66 last year, in the winter period. The Receiver-General also moved a vote totalling £4,885, cost of harbour works during the year ending 31st March next.

They include: £500 for the reconstruction of the Peel old Pier Head; £1,450 for repairs to the Alfred Pier, Port St. Mary; £600 for repairs to the Douglas quay wall at the Double-Corner; £235 for reconstruction of the public lavatories at the Peel breakwater; £600 for removing the fog signal at Douglas Head to a new position not yet decided upon; £7,500 for the reconstruction of the harbourmaster's office at Ramsey.

It was stated the cost of the King Edward VIII. Pier, Douglas, opened a few weeks ago, was £52,000 below the estimate. Negotiations are pending for the borrowing of £58,000 to complete the work.

Up to the last financial year the amounts expended on the pier totalled £151,662. If one adds the £58,000 now to be borrowed, the final cost is apparently under £210,000. The original estimate was £262,000, so that there has been a saving of £52,000. This figure includes an addition to the Fort Anne Jetty, which has not yet been put in hand.

New Dredger for I.O.M.

The Isle of Man Harbour Commissioners have just obtained delivery of the £8,030 new dredger "Mannin." The ship carried out her trials at Gareloch, on the Clyde, and attained a maximum speed of just over 8½ knots. Her guaranteed speed is seven knots. Dredging trials took place on the Clyde. Messrs. Priestman's had Messrs. Lobnitz, of Renfrew, as the sub-contractors, who built the hull of the new vessel. It is a grab-hopper dredger of the latest type, capable of carrying 100 tons of "spoil" or dredged material in the hopper. The derrick at the fore part of the ship looks like an ordinary crane, but is really a highly specialised piece of equipment for operating the grab, which is of a new design known as the "level cup type." There are special steam winches fore and aft for manœuvring the vessel during dredging. The hopper has bottom-opening doors, so that the dredged material can be dumped in the open sea. The other equipment includes a force pump for cleaning foundations of the harbour works.

Extension of Sea Wall.

It was reported at the meeting of the Caernarvon Harbour Trust that a proposal to extend the sea wall near the low-water landing stage had been considered by a sub-committee, which had made arrangements for obtaining an estimate of the cost of the scheme. The breakwater at Llanddwyn was stated to be in good condition following upon recent repairs, and the Trust expressed its appreciation of the satisfactory work done, under the direction of the superintendent (Captain Thomas), both at Llanddwyn and on the steamer "Seiont."

Dee Embankment Proposal.

Mr. H. H. Nuttall, in an address to the Liverpool Branch of the Industrial Transport Association, gave an outline of the engineering project estimated to cost £6,000,000, for the construction of an embankment in three sections, broken by two bridges over river channels, across the Dee from the Red Rocks, Hoylake, to the North Wales coast.

Mr. Nuttall explained he had in mind not merely an embankment that would retain the level of the water of the River Dee behind training walls, but a plan for reclaiming a vast area of the land on the inner side of the embankment.

The work, he said, should be tackled in three sections. The two canals would follow the lines of the existing river channels and enter the sea under the bridges. The value of the land reclaimed would be approximately £1,000,000, and might be the means of setting up new industries on Deeside. The embankment would be about five miles long, 85 ft. in width at the top, and about 200 ft. in width at the bottom.

Vehicles travelling from Liverpool to North Wales would be able to save about 18 miles on the journey by travelling by the embankment, whilst rail travellers would shorten their journey by 24 miles. By being able to strike across the Wirral to reach North Wales, Prestatyn would be brought as close to Liverpool as Southport was. The scheme should be considered in relation to the new possibilities created by the Mersey Tunnel.

Admittedly, £6,000,000 was a big capital outlay, but so far as he could ascertain there were no engineering difficulties in regard to carrying out such an extensive project. Boulder clay on the rock in the river bed would probably be strong enough to support the foundations of the piers for the embankment, which would carry a double railway track, a motor road and a promenade. No road user would object to the Road Fund being employed on such useful constructional work instead of it being diverted to ordinary State purposes. The building of such an embankment was work of a national character and ought to be financed nationally.

In the discussion, Mr. H. Allan raised the question as to the atttiude of the Mersey Docks and Harbour Board. Would the building of an embankment cause the silting up of the River Mersey? Mr. Nuttall explained that he did not think so. In any case, it could be taken as definite that the Ministry of Transport would not countenance any scheme which adversely affected the interests of the Port of Liverpool. So far as he could ascertain, the Mersey Docks and Harbour Board entertained no fears of the embankment prejudicing Liverpool interests.

The meeting unanimously adopted a resolution in the following terms:—"That the time is now opportune for the Minister of Transport to consider proposals for the construction of an embankment across the River Dee, and for improving the navigation of the river. Also, that the local authorities concerned should meet in conference to further the project."

Two New Dredgers.

Protest was made at a recent meeting of the Mersey Docks and Harbour Board against a proposal (which was confirmed) to place a contract with William Simon and Co., Ltd., of Renfrew, to build the two dredgers.

Mr. R. S. Johnson, of Cammell Laird and Co., who is a member of the Board, urged that the business be kept in this district. Mr. Edmund Gardner (Chairman of the Works Committee) pointed out that tenders were received from five companies, and that of William Simon and Co. was the lowest. It had been suggested that the Works Committee should have given preference to Cammell Laird's as a local concern, but as there was a difference of over £5,000 between their tender and that of William Simon and Co., the Committee decided that they had no option but to recommend that Simon's tender be accepted. Where there was little difference in price, the Works Committee had always endeavoured to place contracts locally, but where there was such a large difference, as in this case, the Board would not be justified in doing so. The new dredgers will take the place of the grab dredgers, Nos. 14 and 15, both of which were 38 years old, and had become expensive to maintain. They were due for overhaul and survey during the next twelve months, and if they were kept in commission a considerable expenditure would be required.

Model of Gangway in Court.

An unusual mishap at the Liverpool Landing Stage was re-enacted at the Birkenhead County Court recently, when a model of a gangway on the Woodside luggage boats was used by witnesses to "illustrate" their evidence in the case in which the Cleveland Petroleum Products, Ltd., claimed £89 from the Birkenhead Corporation. The case was a sequel to the remarkable accident at Woodside, in which a 10-ton petrol wagon, loaded with 1,500 gallons of petrol, was suspended between a luggage boat and the Landing Stage for over two hours.

As the vehicle attempted to board the vessel a strong wind and high tide caused the vessel to sway up and down, and when the forepart of the vehicle was on the boat the gangway rose with the swell, and the driver applied his brakes to wait for it to come down again. When it did, he found that the boat had left the stage, with the result that the rear of his wagon was hanging between the gangway and the stage. Attempts were made to get the vehicle back on the stage by bringing the boat alongside and using blocks and tackles, but these failed, as did an attempt to raise the gangway and lift the wagon on board. The wagon was bumped against the side and damaged. Eventually, it was lifted on board the "Bebington" by the Mersey Docks and Harbour Board vessel "Salvor," which brought a crane alongside.

Judgment was entered for the plaintiffs with costs, and a counter-claim for damages by the Corporation was dismissed.

Manchester Dry Docks.

Manchester Dry Docks Company, which owns dry docks, ship and engineering repair works, in the Port of Manchester, recently issued its annual report and balance sheet. This revealed a slight improvement in net profit, the total being £19,178. The directors recommend the payment of a dividend of five per cent. as in the four preceding years.

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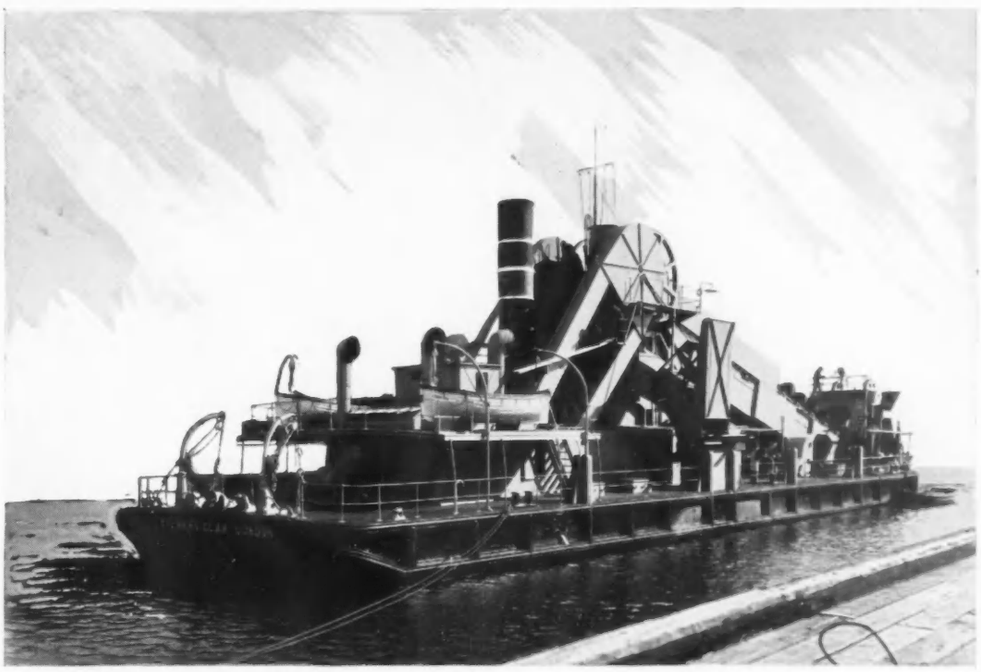
Entirely British



B/D "Stewart Clan" built for the Company by Messrs Lobnitz, Renfrew. N.B
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The Port of Lagos

Panoramic View of Apapa Wharf, Lagos, with Aerodrome (projected inb

Historical

THOUGH isolated efforts to trade on the coast were made as early as the 16th century and kept up spasmodically with varying fortunes, it was not until the early years of the 19th century that the importance of Lagos Lagoon was recognised as a centre of the slave trade, which at that time was a flourishing and most remunerative undertaking.

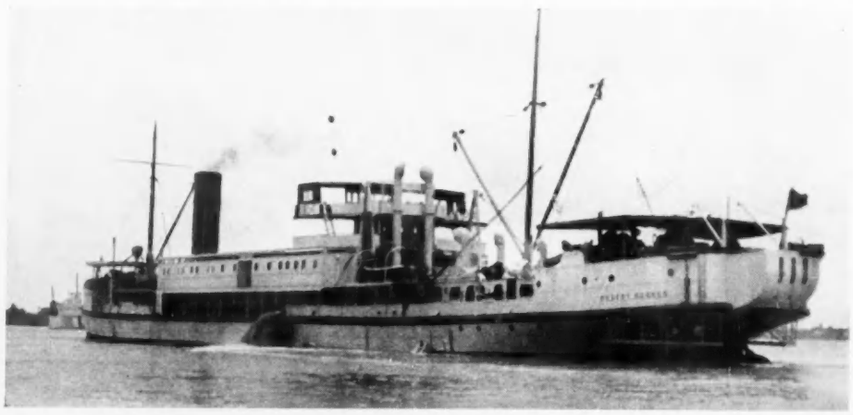
In 1850, Lagos had the reputation of being the biggest slave depot on the Coast, but in December, 1851, decisive action to suppress this traffic was taken under Consul Beecroft with Captains Jones and Lyster and a naval force of 400 men. King Kosoko, a usurper, was driven out after a stubborn resistance, and the exiled king Akitoye, was restored. A treaty agreeing to abolish the export of slaves and to welcome missionaries was signed. Dosumu, Akitoye's son, was, however, unable to stop the slave trade, and in 1861 Lagos was ceded to the British Government with some adjacent territory, and this formed the Colony of Lagos.

From 1866 to 1874 it was administered by the Governor in Chief, Sierra Leone, and from the latter date to 1886 by the Gold Coast Colony, after which Lagos and its hinterland was separated from the Gold Coast and became the Colony and Protectorate of Lagos.

In 1906 Lagos and Southern Nigeria were amalgamated, and again in 1914 the Protectorate of Northern Nigeria was added to the Colony and Protectorate of Southern Nigeria, forming what is now known as the Colony and Protectorate of Nigeria, with an area, including the mandated area of the Cameroons, of 372,674 sq. miles, and a population of 20,000,000 of which 5,500 are Europeans, about 2,000 of whom are in Lagos.

Growth and Development of the Port of Lagos

Lagos is the capital of this large and populous territory and is also the principal port. Its geographical location is Lat. 6° 27 North and Long. 3° 24 East, and the population is about 127,000 people. The town is situated on an island in, as its name implies, an extensive lagoon, forming part of the swampy



Universal Dredger "Robert Hughes."

Seaward End ...gos.

...gos, Nigeria

...rojected inbackground. *In foreground part of 3,000-ton Floating Dock.*

and low-lying region, a feature that is the chief characteristic of the Nigerian coast for over 500 miles, and Lagos Harbour entrance forms the sole outlet for some miles in either direction. The entrance was encumbered by sandbanks and shifting channels, and until 1907 the bar rendered the passage of ships impassable except to those of the lightest draught, so it was necessary to tranship all passengers and cargo destined for Lagos from ocean steamers into branch boats either in the open roadstead, or in the smooth water at Forcados, 120 miles distant.

As the main rail head to such a territory, in addition to the extensive system of waterway it taps, the potential value of such a port was recognised, and in 1907 active measures were started to make Lagos a first-class port, under the guidance of the consulting Engineers to the Nigerian Government. The Marine Department's sand dredger "Egerton" arrived in 1907 and in 1908, entrance works, consisting of a mole on either side of the entrance, with a training bank situated between the two moles were started and gradually extended seaward into deep water.

Other dredgers for the Marine Department arrived in following years, and the work produced such good results that whereas the average maximum recommended draught for vessels crossing Lagos Bar in 1907 was 10 ft., by 1919 this draught was raised to 20 ft., again to 24 ft. in 1925, and to 26 ft. in 1936.

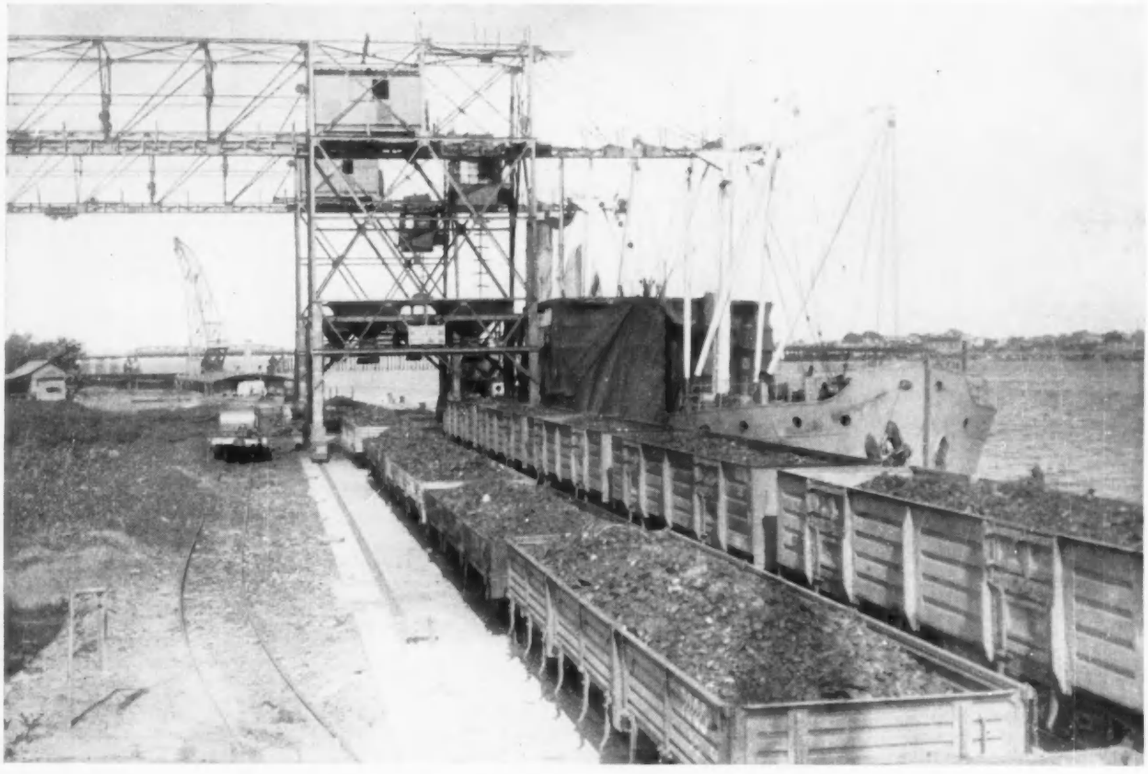
Naturally, a set back was experienced during the war period, but since 1907 over 32,000,000 cubic yards of spoil have been dredged from the bar and its channels and dumped at sea, and approximately 11,000,000 cubic yards have been raised from the harbour channels and used in reclaiming and improving valuable land at various sites which have been developed for railway facilities, wharves, aerodrome, etc.

The present conditions of the port are adequate for the trade, and the maintenance of these conditions as regards the main channels and depths is now possible with two large dredgers. One, "The Lady Clifford," of 1,800 tons capacity, is generally employed at the harbour entrance, and in the approach channels, and she disposes of approximately 1,000,000 cubic yards per annum. The second large dredger, the "Robert

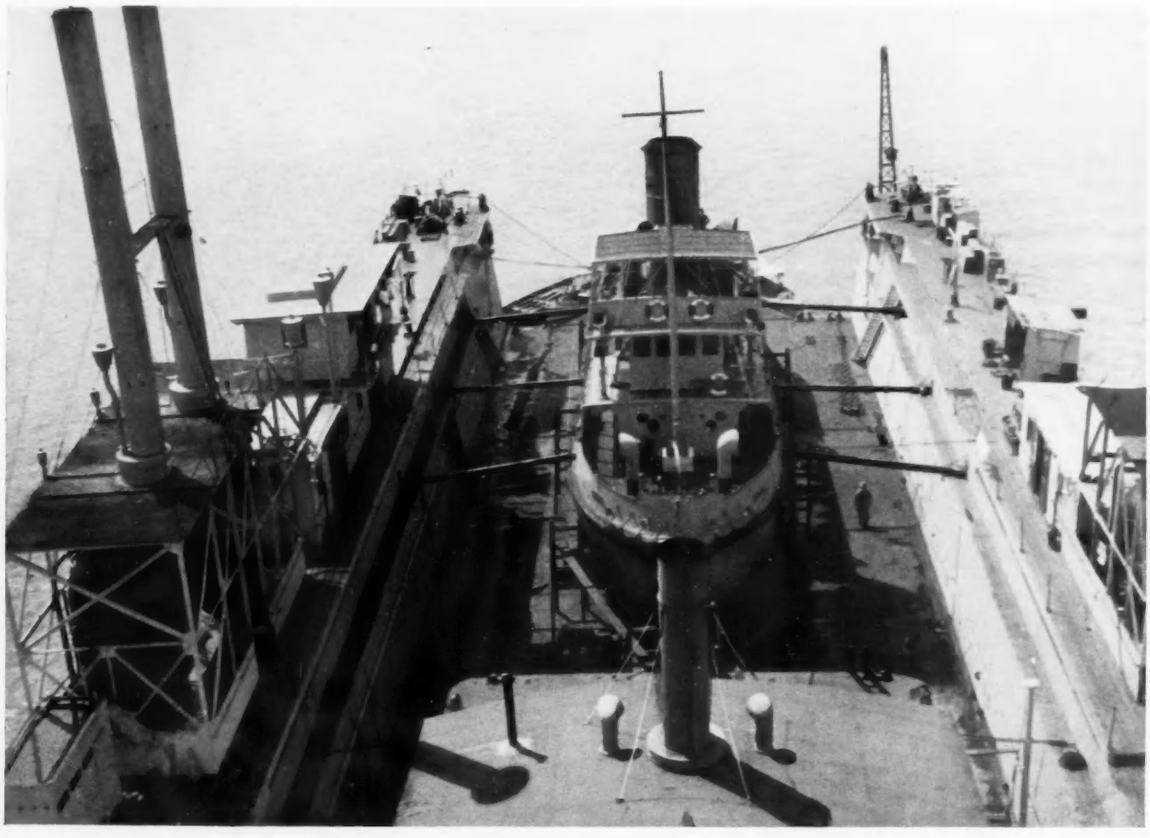
...End ...gos.

Electric Coal Transporters.

Port of Lagos, Nigeria



Electric Coal Transporters with Collier "Ajasa" alongside discharging.

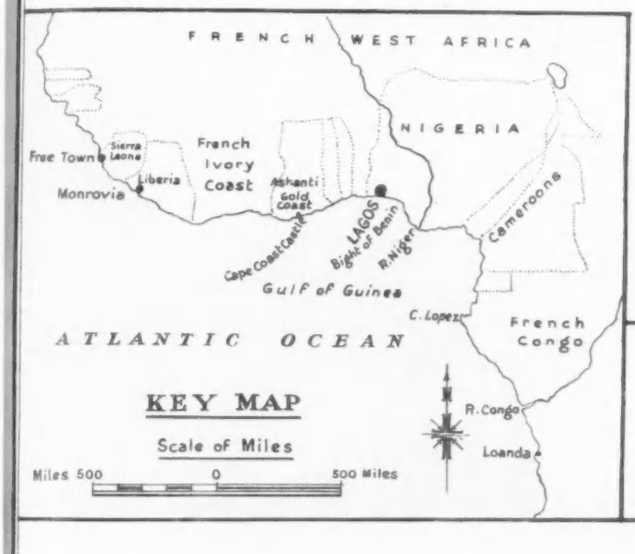


3,000-ton Floating Dock showing Tug and Part of 50-ton Floating Crane in Dock.

LAGOS HARBOUR

(NIGERIA)

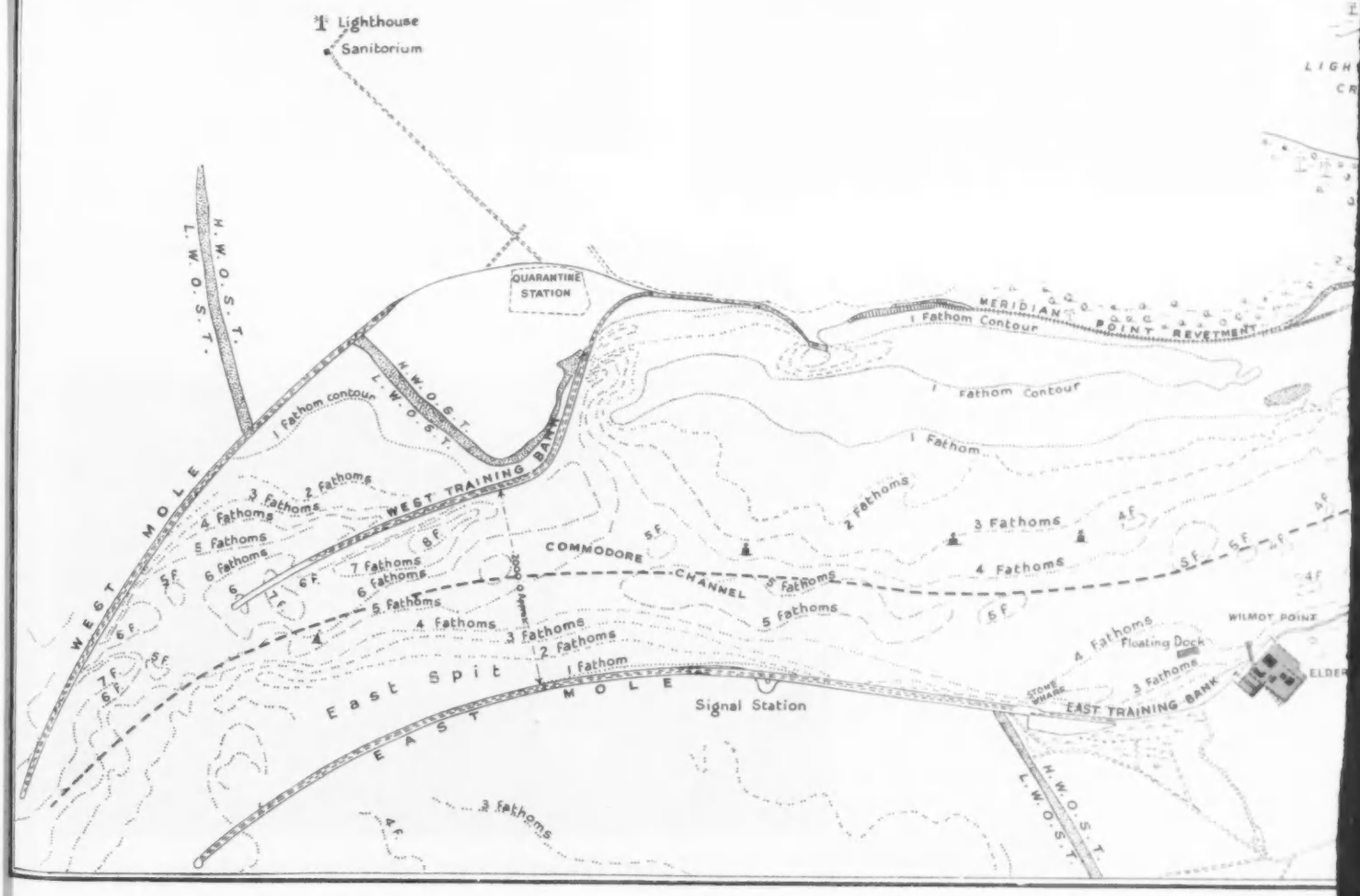
UNDER THE JURISDICTION OF THE MARINE DEPARTMENT, COLONIAL GOVERNMENT, LAGOS.



TIDES

	East Mole Wharf	Govt House Wharf	Customs Wharf	Carter Bridge
Spring Tides rise	3'0"	2'4"	2'0"	2'0"
" " range	3'0"	2'4"	1'6"	1'6"
Neap Tides rise	2'0"	2'0"	1'10"	1'6"
" " range	2'0"	1'3"	1'0"	0'9"

During the season of maximum Freshwater discharge, the water level in the Harbour may be higher by 1'6" than the levels given in the table



WARD & FOXLOW LITHO

CK AND HARBOUR AUTHORITY, JULY, 1936.

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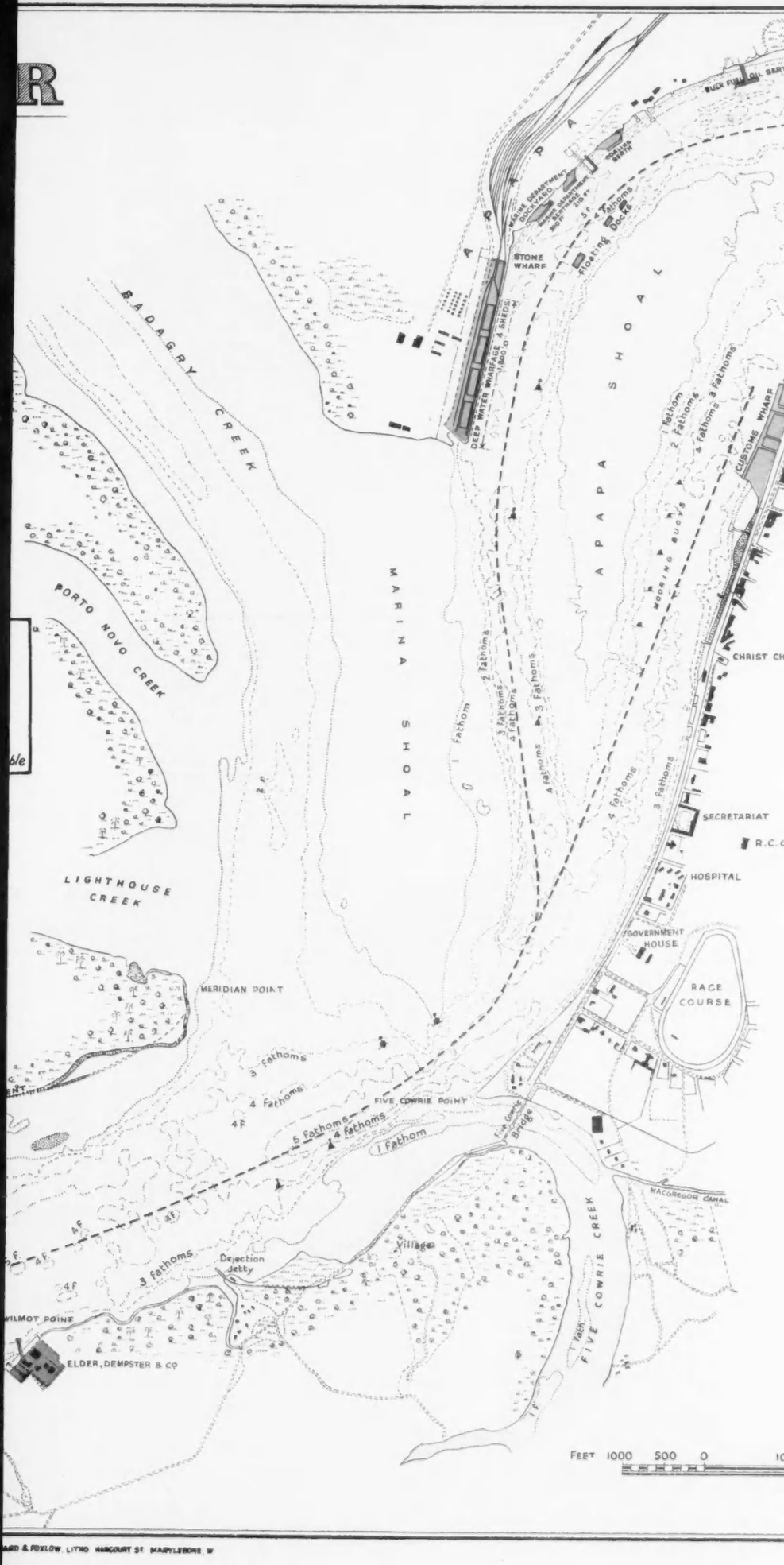
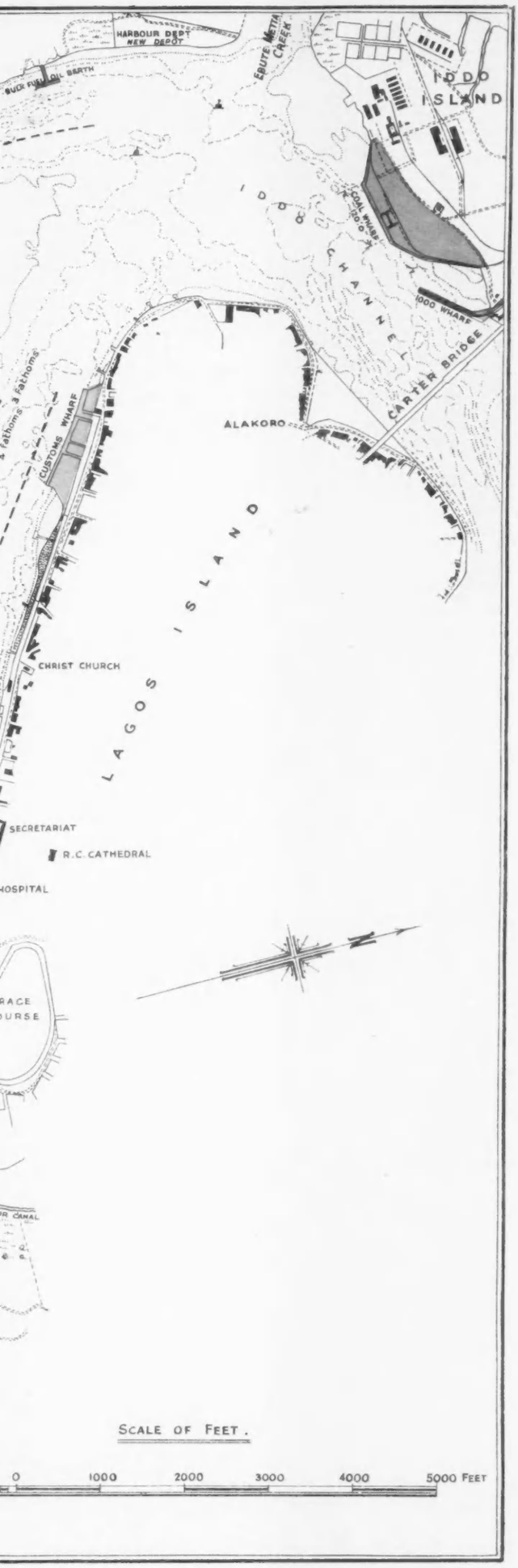
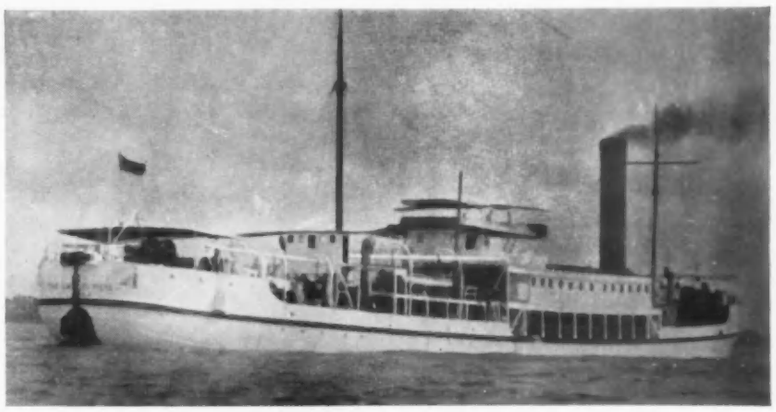


ARD & FOXLOW, LITHO, HARCOURT ST, MARYLEBONE, W.


HARBOUR DEPT
NEW DEPOT
EBUTE METTA CREEK
IDDO ISLAND
IDDO CHANNEL
COAL WHARF
1000 WHARF
CARTER BRIDGE
ALAKORO
CUSTOMS WHARF
LAGOS ISLAND
CHRIST CHURCH
SECRETARIAT
R.C. CATHEDRAL
SCALE OF FEET.
0
1000
2000
3000
4000
5000 FEET

Port of Lagos, Nigeria—continued

Hughes" of 2,500 tons capacity, fitted with a special drag head for the purpose, works similarly in keeping the interior channels in satisfactory order, and also carries out a certain amount of pumping out of her own spoil for reclamation work. A smaller very handy 100-ton grab dredger, the "Mole," clears up accretions alongside wharves and in subsidiary channels where the larger dredgers cannot operate. The majority of the spoil now being dredged is utilised in the reclamation of an extensive area of swamp, immediately behind the railway terminus at Apapa, for an aerodrome which will be ready towards the end of the year. Three smaller dredgers and a complete reclamation unit of one pumping vessel, two tugs and five 1,000-ton reclamation barges are laid up for the present.



The Sand Dredger "Lady Clifford."

The East Mole, begun in 1908, was finished in 1914, after a length of 7,620 ft. had been constructed. The West Mole, started in 1912, was completed to a length of 5,000 ft. in 1922. The West Training bank, commenced in 1915, was considered to be adequate with a length of 3,672 ft., and operations closed down in 1919. In addition, a large amount of stone was used in revetment work inside the harbour.

The minimum width at the entrance to the harbour is 800 ft., with a minimum depth of 28 ft. on the Bar at low water ordinary spring tide. The official draught is 26 ft. From the entrance, the approach channel has a minimum width of 350 ft.

Shipping at Apapa Wharf, Lagos.

with a maximum of 1,000 ft. The range of the tide is 3 ft. 3 ins. at ordinary springs, and the rise of ordinary neaps is 2 ft. 5 ins.

After proceeding three miles up the dredged approach channel this fairway divides, one branch leading to the Customs Wharf by the Customs Channel, and the other crosses the lagoon to Apapa by the Apapa Channel, each leg measuring one mile from the bifurcation of the approach channel.

Connecting up Two-Way Pipe in Reclamation Work.

Wharfage and Berthage

Customs Wharf.

The old Customs Wharf, built 1908-10, on the Eastern or Lagos side of the Lagoon, is 1,183 ft. long, with three single-storey sheds, and this wharf can accommodate vesesls drawing up to 24 ft. Cargo is discharged and loaded with ships' own gear. Along the water front on each side of the Customs Wharf there are numerous small private piers belonging to the various commercial firms, for the purpose of dealing with the large volume of river transport and for lightering cargo to vessels at the buoys.

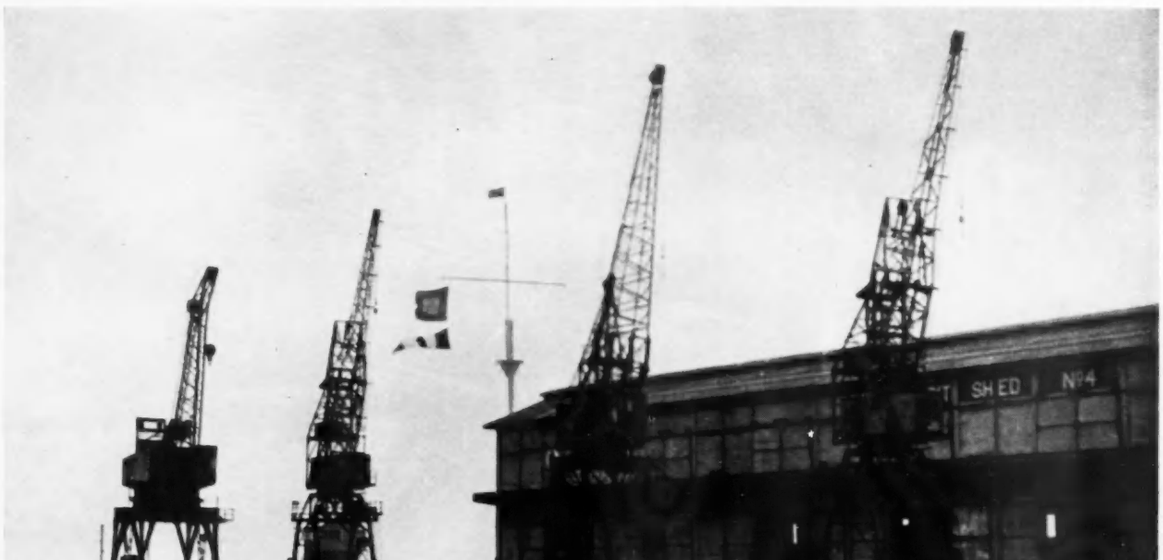
Saw Mill, Ijora, Lagos.

Apapa Wharf.

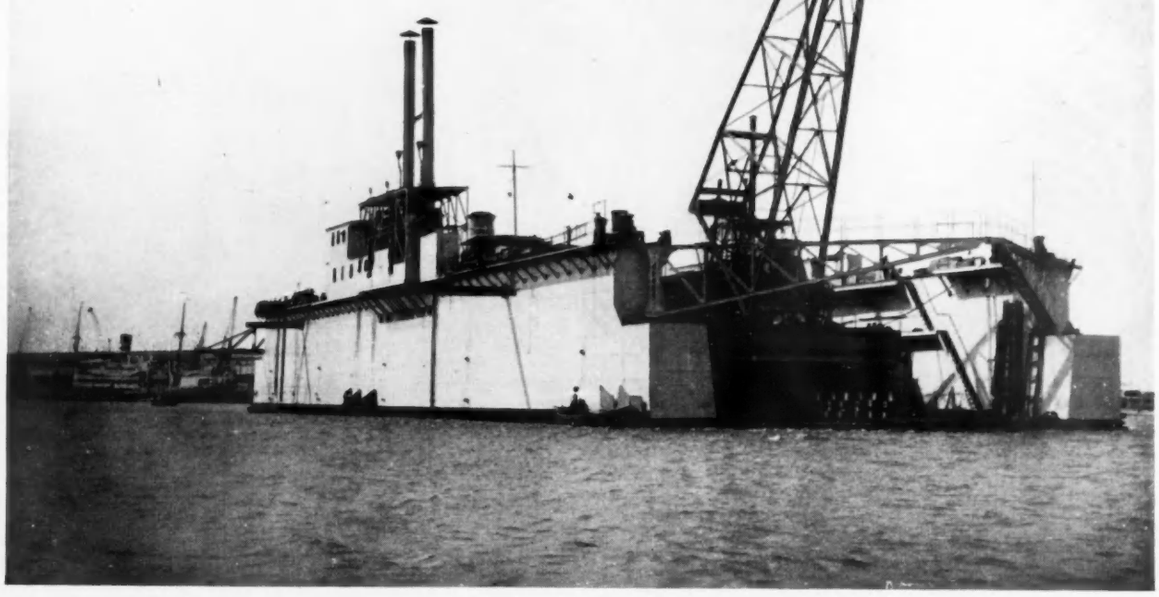
On the Apapa (or western) side of the lagoon, on the mainland, the railway wharfage is constructed of concrete with a frontage of 1,800 ft. and with a depth alongside of 32 ft. Four spacious double-storey concrete sheds, each 340 ft. long and with a width of 70 ft., can store 14,000 tons of cargo. The distance between each shed is 60 ft. There are four berths for vessels, and the wharf can handle 3,000 tons of cargo per day.

There are thirteen electric cranes on this wharf. One at the south end of the wharf is capable of dealing with lifts up to 25 tons. Of the twelve electric travelling cranes there are two of 5 tons, and four of 3 tons lifting capacity, and the remaining six are for lighter lifts up to 2 tons. The cranes can discharge cargo direct into wagons, which run on a double track throughout the whole length of the wharf,

Port of Lagos, Nigeria



Part of Apapa Wharf, Lagos.



50-ton Floating Crane in the 3,000-ton Floating Dock.

Port of Lagos, Nigeria—continued

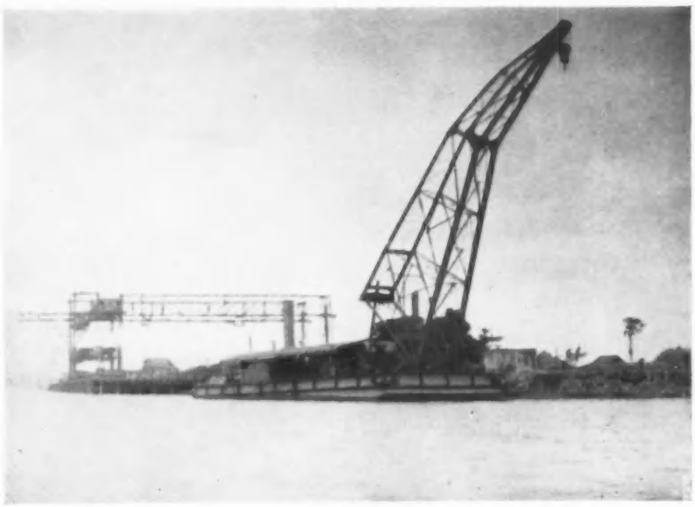
or they can span the three tracks and discharge into the transit sheds top storey which are provided with a wide verandah for the purpose. The distance from the quay face to the transit sheds is 56 ft.

Other tracks also run immediately behind and alongside the sheds, from the upper storeys of which cargo can be loaded into wagons from one-ton fixed electric cranes, each shed possessing three of these handy machines.

Opposite the sheds and separated from them by the railway tracks, a wide roadway provides ample room for road traffic, and fronting this road are the railway offices for the Apapa Wharf, the Railway Restaurant, and the Wharf Inn, an excellently-managed seamen's hostel for white seamen, which is greatly appreciated by the crews of vessels visiting the port. This wharf, a valuable addition to the port facilities, was started in 1922 and finally completed in 1927, at a cost of £1,021,287.

Apapa is the terminus of the Western Division of the railway, which runs in a north-easterly direction for 850 miles to Nguru, which is within a few miles of the northern frontier of Nigeria. It connects with the Eastern Division of the railway at Kaduna Junction.

The Marine Dockyard adjoins the railway wharf, and to the northward of this is a wharf owned by the West African Soap Company, a subsidiary of the United Africa Company, over which bulk palm oil is piped from the bulk oil installation. Vessels of the United Africa Company, with a draught of 25 ft., can berth at this wharf.



50-ton Floating Crane. Electric Coal Transporters in distance.

Petroleum Jetty.

The Government Bulk Petroleum Jetty, built in 1933, is 260 ft. long, and can accommodate vessels with a draught of 25 ft. It is constructed of concrete, and is situated a quarter of a mile north of the West African Soap Company.

Oil tankers are expeditiously discharged by the pumping machinery of the Shell installation into the several large tanks owned by that Company, which have a capacity of about 11,000 tons of bulk oil. For case oil storage space is provided for about 40,000 cases.

Ijora Wharf.

The next wharf on the western side of the lagoon is situated at Ijora, on Iddo Island, an eyot connected to the mainland on the western side by the Denton Causeway and on the eastern side by Carter Bridge to the Island of Lagos. Ijora Wharf was completed in 1925. It is constructed of concrete and can accommodate vessels drawing 18 ft. Practically all the coal used by the Western Division of the Railway is discharged by two electric transporters to a dump at the back of the wharf from the Government colliers, one of which carries 2,800 tons, and maintains a weekly service between Port Harcourt and Lagos, mainly for the Railway and Marine Departments. Approximately 55,000 tons are required by the Western Division of the Railway and about 20,000 for the Marine Department. Port Harcourt, 37 miles up the Bonny River, and 151 miles from the Udi coalfield, is the rail head for the Eastern Railway.

Mooring Buoys

Marina Buoys.

There are five heavy mooring buoys laid down on the west side of the Customs Channel, providing accommodation for four vessels of from 300 to 450 ft. in length and 24 ft. draught, moored bow and stern.

Pool Mooring Buoys.

In addition to these mooring buoys in the inner harbour, there is also anchorage for four vessels of a draught of 22 ft. just inside the harbour entrance. If necessary accommodation could be found in the Port of Lagos for 22 ocean-going vessels at one time. The lighterage necessary for vessels loading and discharging at the buoys is carried out by the numerous lighters and tugs maintained by the various shipping companies.

View from Marina, Lagos. Middle View—Ship at Buoys; Distant View—Apapa Wharf.

Navigational Aids and Control of Shipping in the Harbour

A lighthouse, 85 ft. above high water, and painted with white and black bands, is situated on the west side of the entrance. It exhibits a white double flash every 10 seconds, and is visible for 15 miles.

In Lagos Roads, an automatic gas-light buoy exhibits a white flash every 4.5 seconds, which is visible for about seven miles. An efficient buoyage system of 3rd class can and conical buoys delineate the harbour channels.

As the channels are narrow and the dredgers of the Marine Department are generally working in the channels, the movements of vessels in the port are controlled by a code of signals operated from the Mole Signal Station at the entrance, at the Town Signal Station, Lagos, and the Apapa Signal Station. Pilotage is compulsory for all ships of more than 10 tons registered tonnage, ertering, leaving or changing berths.

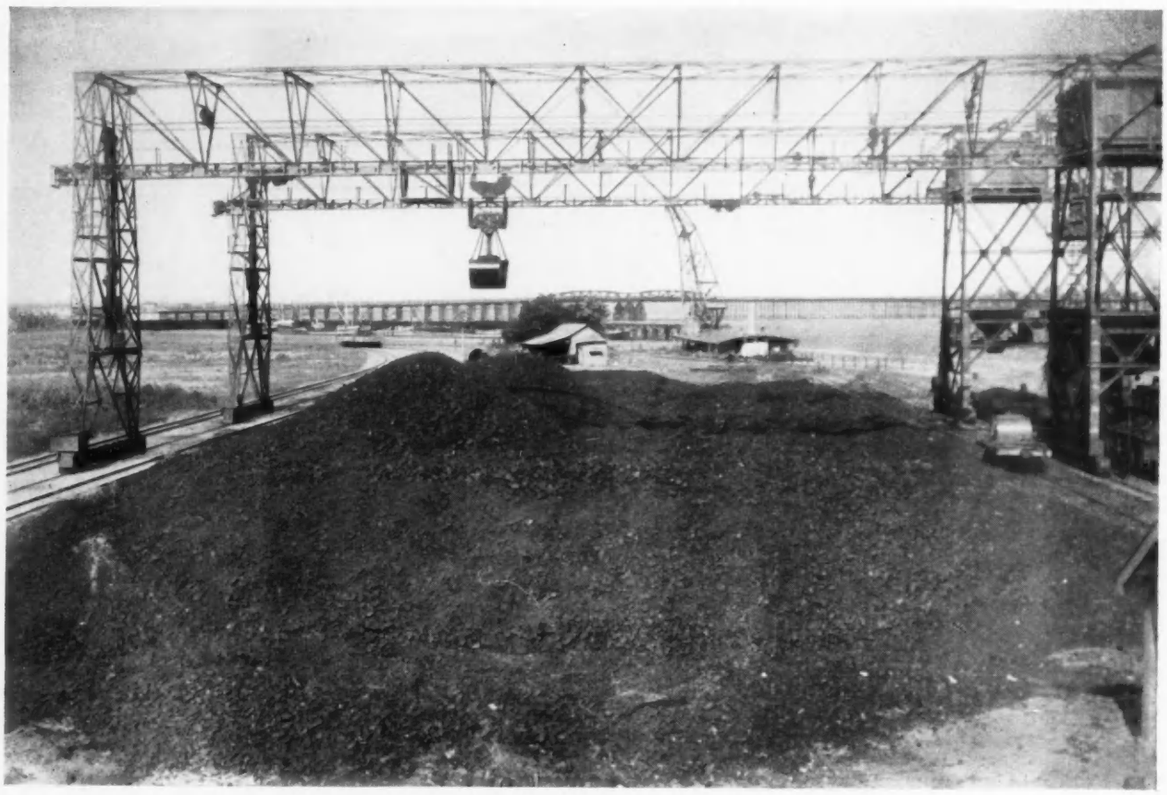
Two powerful tugs, the "Atlas" and the "Vulcan," each of 1,200 h.p., are specially maintained as aids to shipping. A lifeboat is also maintained for the pilots to board vessels outside the Bar.

Communications

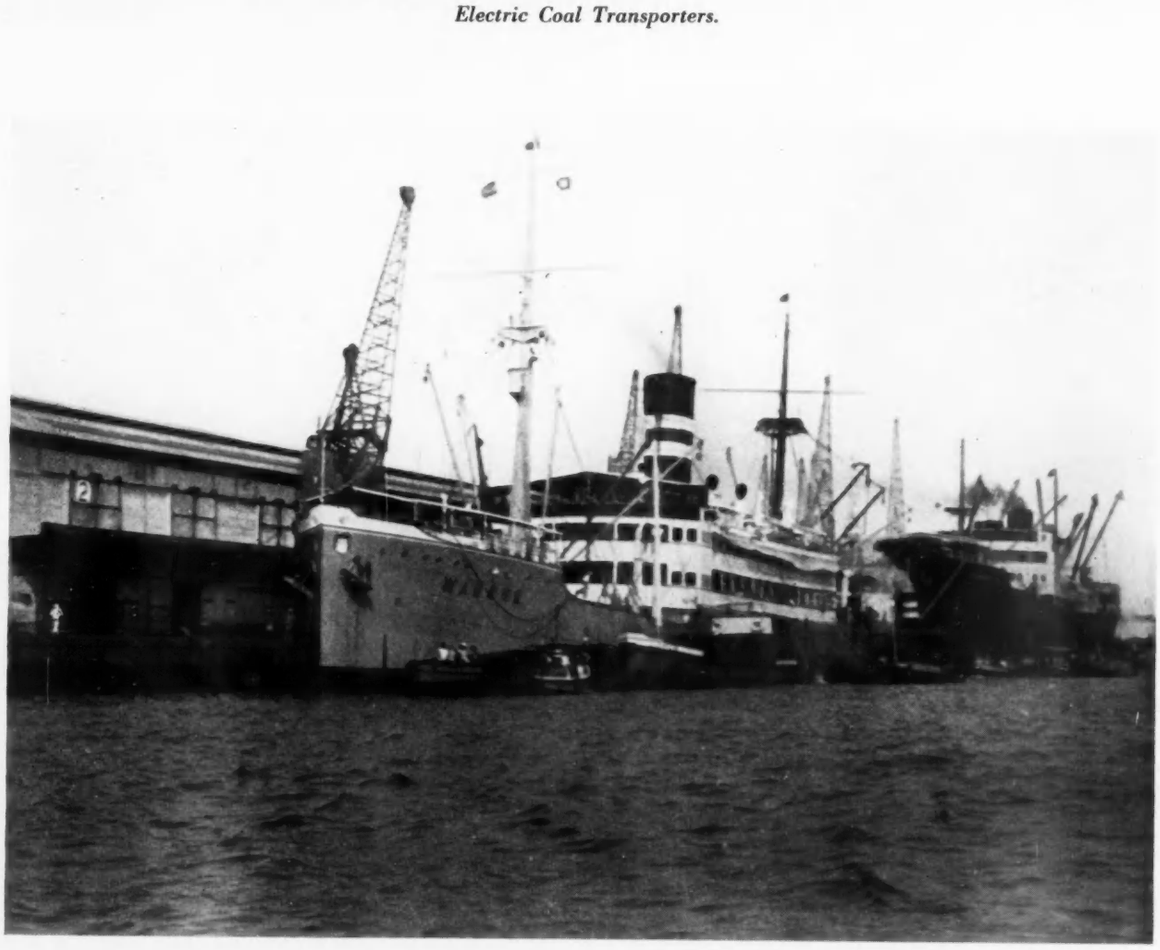
Port.

Carter Bridge, a new structure completed in 1932, connects Lagos Island with Iddo Island, which in turn joins the mainland by Denton Causeway. The bridge is 2,133 ft. long, not including approaches, and 58 ft. wide, this width consisting of a carriage-way of 38 ft. and two 10-ft. ways for pedestrians.

Port of Lagos, Nigeria

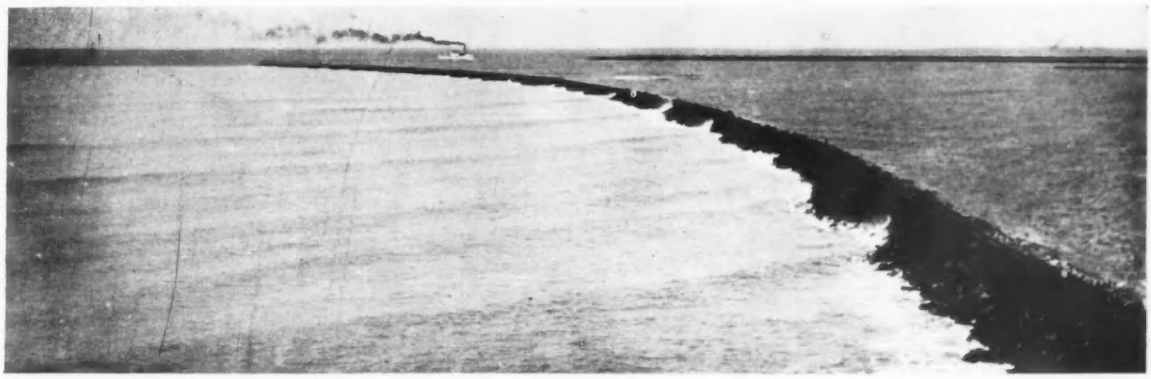


Electric Coal Transporters.



Shipping at Apapa Wharf.

Port of Lagos, Nigeria—continued



Part of East and West Moles, Lagos, with Sand Dredger "Lady Clifford" entering Harbour.

Ferry.

A steam ferry runs at frequent intervals during the day between Lagos and Apapa. The fare is one penny each way.

Inland Waterway Service from Lagos.

A Government steam launch connects with the mail steamer and serves several out-stations, and many commercial motor launches maintain more or less regular services through the creeks for hundreds of miles to inland stations, and also to Porto Novo in Dahomey.

Passenger Steamship Services.

Elder Dempster Lines, Limited, maintain a regular fortnightly mail service to Lagos and a smaller up-to-date motor passenger vessel feeds the other ports of Nigeria. Monthly services are also maintained by the Woermann Linie from Southampton, by the Holland West Africa Lijn from Havre, and the Fabre-Fraissinet Line from Marseilles.

In addition, the steamers belonging to the United Africa Company and John Holt and Company maintain fairly regular services, and have good accommodation for a limited number of passengers.

The principal Steamship Lines maintaining regular services to Lagos are:—

Elder Dempster Lines, Limited; The United Africa Company, Limited; John Holt and Company; American West African Line; Compagnie Fabre et Fraissinet; Holland West Africa Lijn and allied companies; Woermann Linie and allied companies; Navigazione Libera Triestina Line.

Air Service.

As soon as the aerodrome is completed a weekly air mail service, to be maintained by the Imperial Airways, will be inaugurated, and this is expected to take place before the end of the year.

Railway Communication.

From Apapa Wharf the mail line runs to Kano (705 miles) and in all, with connecting branch lines, there is a total of 1,905 miles of railway open to traffic in Nigeria linking up the more important towns of the country and tapping the productive areas. A well-appointed Boat Express with dining and sleeping cars is run between Lagos, Jos and Kano in connection with the homeward and outward mail steamers. Kano is reached in 41 hours. Outward and homeward-bound passengers by the mail steamers, entrain and detrain at Apapa Wharf where waiting rooms and a restaurant are available, and the Boat Express conveniently runs alongside the vessel.

The outward-bound passenger vessels usually disembark passengers in Lagos, and passengers for up-country are ferried to Apapa where the train is in readiness. In addition to the Boat Express, there is a regular passenger train service with dining and sleeping cars to Kano and Jos three times a week.

Imports and Exports

The main imports consist of bread, biscuits, fish, rice, flour, chemicals, drugs, dyes, cooper's stores implements, earthenware, enamelware, glassware, furniture, machinery, motor cars, soap bags, petroleum, cotton goods and machinery.

The main exports are palm kernels and oil, mahogany, cocoa, ground-nuts, cotton, hides, shea products, tin ore, copra and piassava fibre.

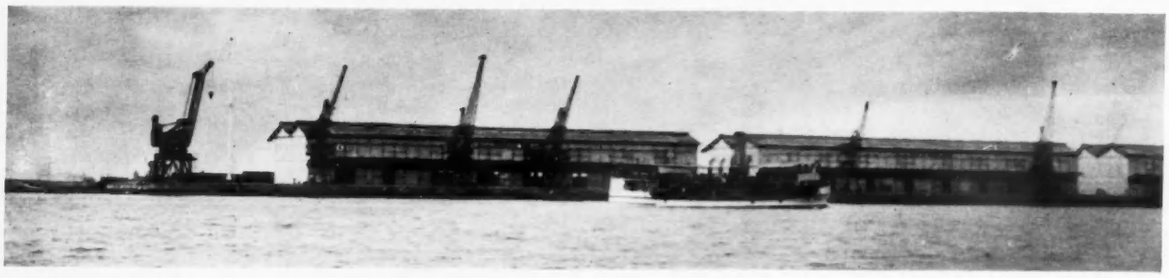
Growth of Trade

To illustrate the growth of trade, and the necessity for the Port of Lagos to keep abreast of this development and also to plan in advance, it will be of interest to note that the total

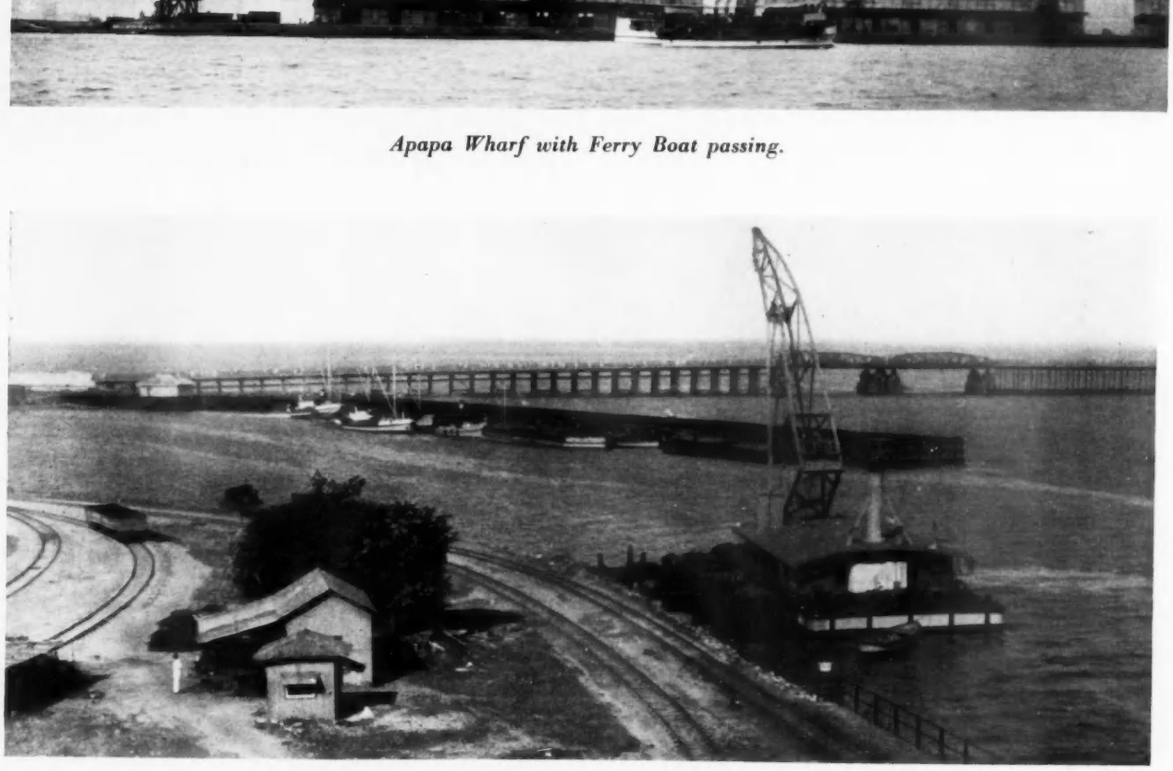
Landward Portion of East Mole, Lagos.

The Sand Dredger "Lady Clifford" entering Lagos Harbour.

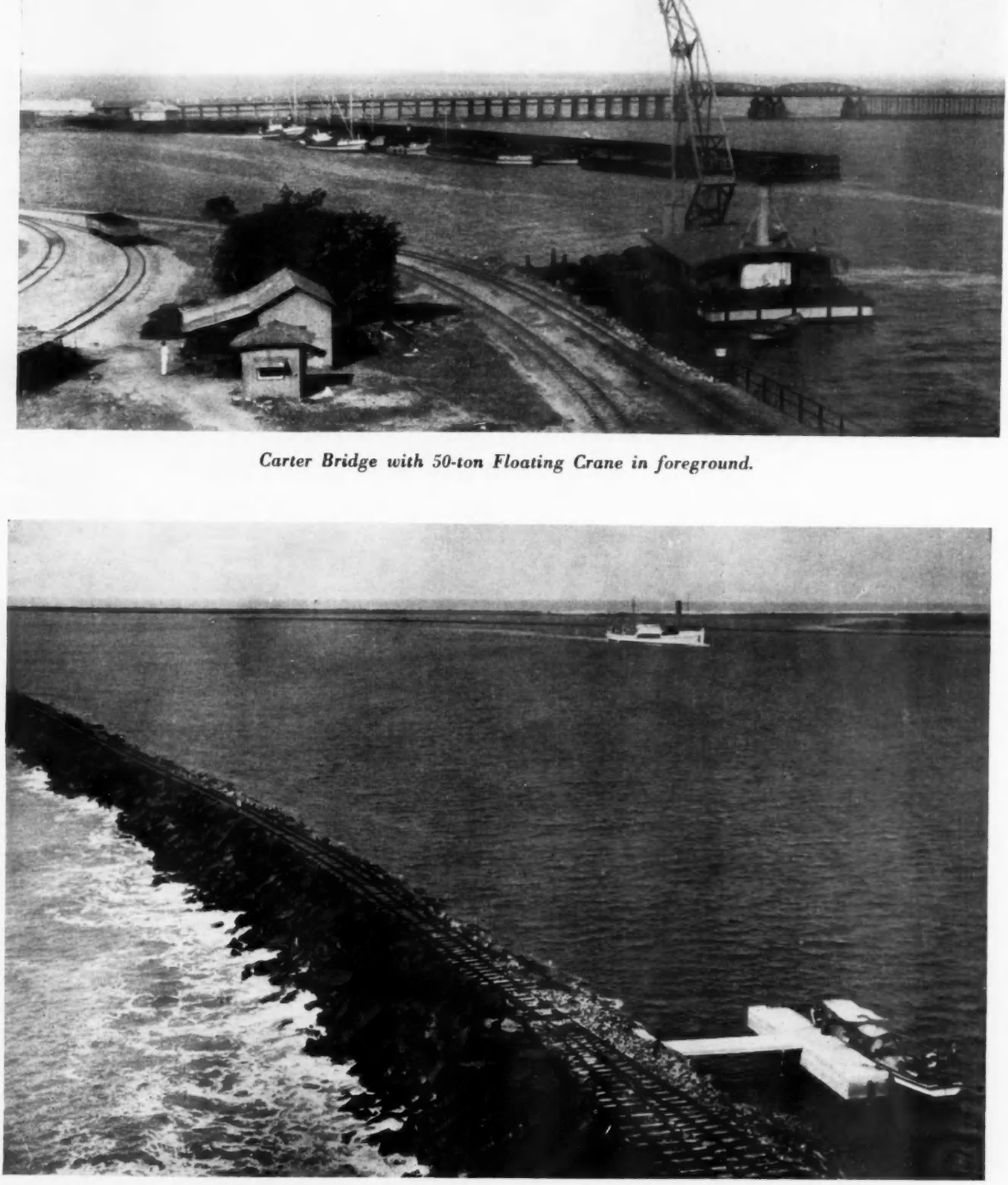
Port of Lagos, Nigeria



Apapa Wharf with Ferry Boat passing.



Carter Bridge with 50-ton Floating Crane in foreground.



Looking South. Part of East and West Moles showing Training Bank between.

Port of Lagos, Nigeria—continued

value of trade in Nigeria in 1903 was £4,935,200, consisting of £2,356,892 imports and £2,578,308 exports. Trade steadily increased (except for the abnormal year 1919, when the total trade amounted to £42,203,527) until 1928, when a total value of £33,870,458, consisting of £16,663,525 imports and £17,206,933 exports was recorded.

More than half of this was dealt with by the Port of Lagos, and the remainder was split up between the eleven other ports of Nigeria.

The catastrophic fall in the prices of the main exports, ground nuts, palm oil and kernels, etc., was then felt, and the full force of the depression was experienced in 1931-32 to such an extent that the total value of Nigerian trade in 1931 was down to £17,388,718, a drop of nearly 50 per cent., compared with 1928.

Generally speaking, exports were very little affected; actually in the case of cocoa, ground nuts, cotton-seed, and palm kernels, there was a substantial *increase* in tonnage over the 1928 figures, but the prices were practically nominal, and imports decreased alarmingly. Retrenchment was the order of the day, but with 1934 came the turn of the tide. Prices, and import and export figures all improved in 1935, and Lagos again became a busy port.

The total tonnage of export and import cargo shipped and landed in the Port of Lagos is shown below for the years 1931 to 1935:—

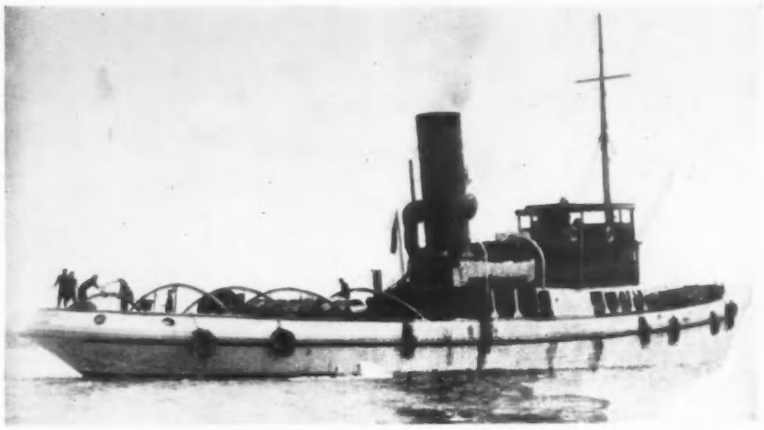
	Imports	Exports	Total
1931	175,594	305,478	481,072
1932	145,492	338,729	484,221
1933	129,968	318,094	448,062
1934	137,696	399,560	537,256
1935	190,741	416,106	606,847

The tonnage for 1935 was handled by 815 ships of a net registered tonnage of 3,681,643. The value of this cargo tonnage was £11,243,840, made up of £4,956,710 of imports and £6,287,130 of exports. The total value of the whole trade of Nigeria for 1935 was £20,348,930, imports accounting for £8,299,287 and exports £12,049,643, which indicates the value of the Port of Lagos to Nigeria. This improvement in the volume of trade resulted in an increase of 32 per cent. over the revenue estimated for Customs duties in 1935.

Approximately four-fifths of the trade is with the United Kingdom. Germany comes next in order of importance, followed by the United States and France.

Repair Facilities

The Government Marine Dockyard under the Marine Department at Apapa is capable of dealing with any kind of above-water repair work to shipping, and to work below water-line, with the aid of the floating docks, to vessels not exceeding about 3,000 tons weight and 56 ft. beam. All machinery is driven by electricity, and up-to-date electric and oxy-acetylene welding plant is installed.



Steam Tug "Vulcan," Nigerian Marine.

25-ton Electric Crane, Apapa Wharf.

The capacity and dimensions of the two floating docks are as follows:—

No. 1 Floating Dock.

Lifting capacity, 3,000 tons (it *has* docked a ship of 4,000 tons); length over pontoons, 270 ft.; clear width at entrance, 57 ft.; draught on 4-ft. blocks, 16 ft.

No. 2 Floating Dock.

Lifting capacity, 450 tons; length over pontoons, 139.5 ft.; clear width at entrance, 37 ft.; draught on 3-ft. blocks, 7 ft.

Slipways.

No. 1 slipway has a lifting capacity of 400 tons; draught of vessel, 7 ft.; inclination of slipway, 1 in 15.

No. 2 slipway. Lifting capacity, 60 tons; draugh of vessel, 4 ft.; inclination of slipway, 1 in 12.

Cranage.

Five, ten and 15-ton cranes are situated in the Dockyard, and there is also a 50-ton floating crane with a range of hook 65 ft. above water level to 35 ft. below water level with an outreach of 50 ft. There are numerous lighters from 5 to 100-ton capacity, and also 5 open hopper barges of 1,000-ton capacity maintained by the Marine Depart-

Reclamation Work showing Pumper in action. The Stiff Spoil is stirred up by a Swirler and the Mixture pumped out on to the Site.

Port of Lagos, Nigeria—continued

ment with the necessary small steam and motor craft, in addition to three powerful tugs.

A buoyage and survey vessel, the " Dayspring," was built in 1928 for the purpose of dealing with the large ocean light-buoys, and her derricks can deal with lifts up to 20 tons. A specially constructed horn over the bow can deal with heavy lifts of 40 tons. The two bar tugs previously mentioned under " Control of Shipping" are equipped for ocean salvage work, and are the only adequate craft available for such work between Dakar and Capetown.

The Nigerian Dry Dock and Engineering Company has a well-equipped workshop, and a slipway of about 300 tons capacity. This firm is a subsidiary company of Elder Dempster Lines, Ltd., and maintains, and builds in part, the numerous local small craft belonging to that company. Outside work can also be undertaken.

Latest Trade Figures

	Cargo Landed Tons	Cargo Shipped Tons
November, 1935	15,519	66,755
December, 1935	16,102	74,607
January, 1936	18,940	55,558
February, 1936	19,410	47,782

The heaviest tonnages occur during the ground nut exporting season, i.e., from October to March.

Number of Passengers Landed and Embarked

	PASSENGERS LANDED		PASSENGERS EMBARKED	
	1st and 2nd Class	3rd Class and Deck	1st and 2nd Class	3rd Class and Deck
1932	3,108	6,317	3,153	6,079
1933	3,107	5,849	2,977	5,910
1934	3,011	5,250	2,934	5,678
1935	3,141	6,317	2,827	6,039

The majority of 1st and 2nd Class passengers are Government servants.

50-ton Floating Crane in 3,000-ton Floating Dock.

Port Expenditure

Apart from running expenditure and exclusive of the building of the Marine Dockyard at Apapa, cost of reclamation of various sites and expenditure by railway from their own funds, a sum of approximately £5,000,000 has been expended on Lagos Harbour for plant and capital works.

S.S. Dayspring - Survey and Buoyage Vessel, Nigerian Marine.

The details are as follows:—

EXPENDITURE FROM REVENUE

	£
1909 New Dredger	60,000 (Estimated)
1910 " Sandgrouse " (reconditioning) ...	8,130
1911 New Tug	15,000 (Estimated)
1912 Purchase of Grab Dredger	1,500 (,,)
Purchase of Bucket Dredger " Queen Mary " (1919-1920)	60,527
Produce Wharves, Lagos (1920)	3,911
Recurrent Expenditure on Lagos Harbour Works and Aro Quarry (1923-1935)	308,181
Special Expenditure on Lagos Harbour Works and Aro Quarry excluding Mooring Berths, Apapa Dockyard (1926-34)	107,640
Two New Hopper Barges (1924-25)	27,573
Mooring Berths, Apapa Dockyard (1925-1930) ...	105 297
Floating Crane (1926-1929)	20,931
	£718,690

EXPENDITURE FROM LOAN FUNDS

	£
Lagos Harbour Works	1,280,304
Lagos Wharfage Scheme	410,000
Apapa Extension and Wharf (1911 Loan) ...	24,574
Apapa Wharfage Scheme	1,021,287
Dredgers and Dredging Plant	707,617
Iddo Coal and Petroleum Wharf	298,833
Dredging Apapa Iddo Channel	40,887
Bulk Fuel Oil Wharf, Apapa	71,008
Floating Dock	57,469
Slipway, Apapa Dockyard	30,454
	£3,942,433

Port Management

The Port of Lagos is managed by Government, the authorities most actively concerned being the Marine, Railway and Customs Departments.

Chester Basin, Liverpool.

The general manager of the Mersey Docks and Harbour Board has written to the Liverpool Corporation Health Committee stating that the Board is of opinion that the Corporation should put in hand, without further delay, the work of laying out the site of the Chester basin, in accordance with the terms of the agreement existing between the two parties. Liverpool City Engineer has been called upon for a report on the matter.

Spreading Light in Africa.

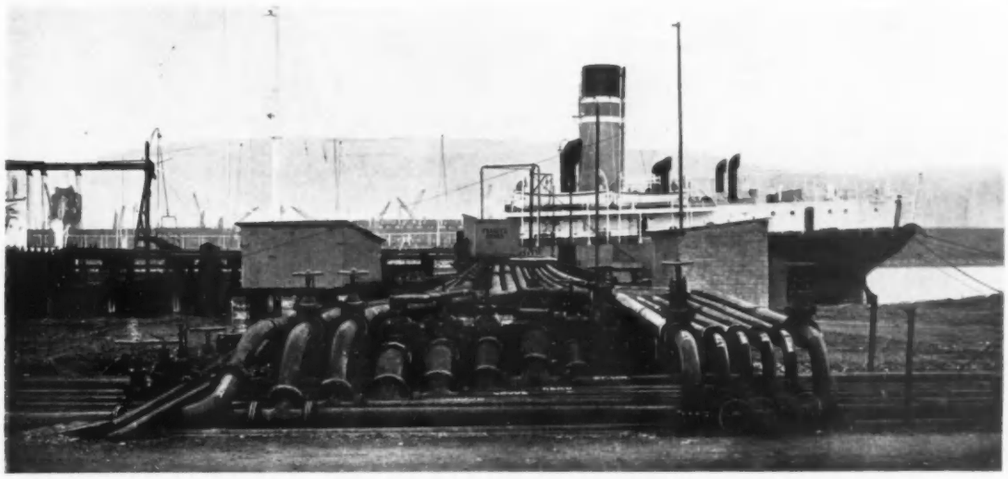
Light is to be spread on an African coast which has for years been shunned by ships.

On October 1st, South Africa's largest lighthouse will come into operation at Cape Columbine. With a strength of 9,500,000 candle-power, it will be more than three times as powerful as the Durban Bluff light, which has 3,000,000 candle-power.

The lighthouse, whose beams will be visible twenty-four miles away, has taken nearly two years to build and has cost £16,000.

Protection of Oil Tanks against Fire

Notable Installation at Queen's Dock, Swansea



"Foamite-Two-Solution" Pipe Lines on the Left of the Oil Pipe Lines on one of the Piers at the Queen's Dock, Swansea.

THE standard method of protecting oil store tanks against fire, and also oil supply pipe lines and oil-operated vessels, is the use of foam, that is a mass of bubbles filled with carbon dioxide gas.

In this connection of great interest is the latest design of "Foamite-Two-Solution" plant, of which a notable example is the extensive installation at the Queen's Dock, Swansea, supplied by Foamite Firefoam, Ltd., of London.

The foam method, it will be remembered, consists in the use of two powders, acid and alkali, which on mixing in solution in water generate a vast volume of bubbles. These powders are a bicarbonate with the addition of a foam "stabiliser," which is an organic colloid, and a harmless acid salt. The latter interacts with the alkaline bicarbonate to give carbon dioxide, in addition to a hydrate. As a result, the small bubbles formed are composed of a film of the hydrate filled with carbon dioxide gas, the walls being strengthened by the colloidal stabiliser, so that no collapse takes place on contact with a fire.

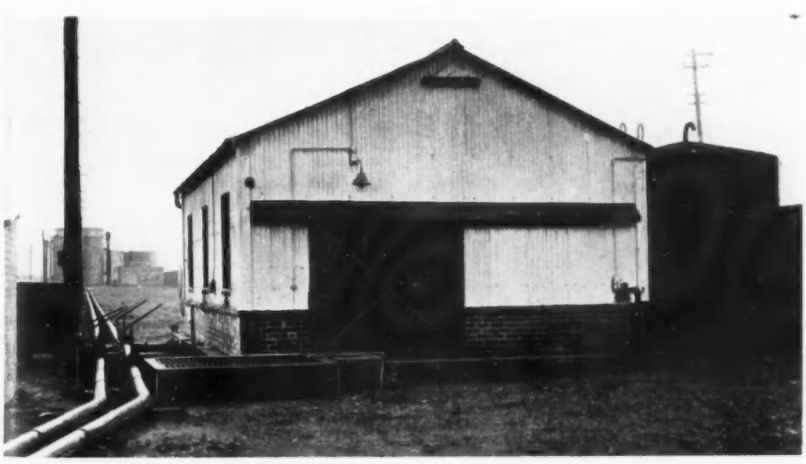
Essentially the action of a mass of closely associated, wet, tough, small carbon dioxide bubbles of this type is both elimination of air by a non-inflammable gas, and therefore "smothering" of the flames, along with cooling to below the ignition point, which extinguishes immediately fires resulting from oil, petrol, benzole, toluol, alcohol, tar, and similar inflammable and dangerous products.

In the case of oil storage tanks two vertical pipes are provided on the outside leading from the ground to a mixing and deflector hooded chamber at the top, so arranged in the side of the tank that even if the roof is blown off the extinguishing action proceeds as usual.

In the "Two-Solution" method these vertical pipes connect by twin pipe lines to a central plant outside the danger area, consisting of dissolving tank, solution storage tanks, and a duplex force pump, along with other accessory equipment, including a battery of control valves. When a fire starts in a store tank the separate solutions of the two solid ingredients are immediately pumped under considerable pressure to the two vertical pipes outside the tank and meet in the discharge hood at the top, instantly generating a huge volume of bubbles, which discharge with great rapidity over the top of the burning oil and smother the flames. In addition, hydrants can be coupled to the pipe mains at desired points, using two separate lengths of hose, so that a pressure stream of foam is discharged from the nozzle in which the solutions mix.

At the Queen's Dock, this central plant consists of a corrugated iron pump-house with two large vertical cylindrical solution storage tanks and a concrete dissolving tank alongside, whilst the two discharge pipes for the solutions extend side by side for the full length of the dock, being laid on the ground. In this way the oil storage tanks are completely protected whilst each of the five piers are provided with "Foamite" hydrants to protect the oil-loading pipe lines for the ships.

The concrete dissolving tank is at the ground level with a grating on the top through which the correct amount of one of the solid ingredients is added, water, steam, and compressed air inlet pipes also being provided. By this means, using hot water with air agitation, the solid is dissolved very rapidly and the solution pumped to the corresponding storage tank. The other solid is then dissolved in the same way, the tank for the acid salt solution being lead lined. As regards the duplex pump this is of the horizontal reciprocating type, taking the solution by separate pipes from each storage tank and discharging it under considerable pressure to the twin pipe circuit, which is of steel suitable for use up to 125 lbs. per sq. in. pressure. Also the pump-house may contain an air compressor, a receiver for the compressed air, and all the necessary valves.



"Foamite" Pump-house and Solution Storage Tanks and Dissolving Tank at Queen's Dock, Swansea, showing also the Twin Discharge Pipes laid on the ground for the Two Solutions.

Bombay Port Trust

At a meeting of the Trustees of the Port of Bombay held on 5th May, 1936, the following were the main items of business disposed of:—

The election by the Bombay Municipal Corporation of Sir Jehangir Bomon-Behram, Kt., as a Trustee in place of the Honourable Mr. Hoosenally Rahimtoola resigned, and a Government Notification appointing Mr. J. H. F. Raper to be a member of the Board *vice* Mr. L. Wilson proceeding on leave, were recorded.

Subject to the sanction of Government, Mr. G. E. Bennett, Chief Engineer, was granted three months and 21 days' leave with effect from 8th June, 1936, and Mr. A. Hale-White, Deputy Chief Engineer, was appointed to act as Chief Engineer.

The purchase during 1935-36 of Bombay Port Trust rupee and sterling debentures at the cost of Rs. 22.6 lakhs for the investment of Sinking Fund and other fund balances was confirmed.

The following expenditure estimates were sanctioned against Budget provision:—

Rs. 85,000 for repairs and renewals to Victoria Dock entrance gates;

Rs. 15,000 for overhaul and repairs to cargo cranes in Alexandra Dock;

Rs. 3,370 for installing latrines and water taps at Prince's and Victoria Docks Warehouses;

Rs. 1,200 for renovating the old Clare Bunder Warehouse, Elphinstone Estate;

Rs. 2,725 for raising the surrounding area and laying paved paths to the latrines and washing places of the railway quarters at Wadala.

Imports and exports at the Port of Bombay:—

Quarter ended March	1934-35 Import Tons	1934-35 Export Tons	1934-35 Total Tons	1935-36 Import Tons	1935-36 Export Tons	1935-36 Total Tons
Docks ...	476,546	414,093	890,639	484,910	517,969	1,002,879
„ (overside and trans-shipment)	27,013	45,219	72,232	26,303	58,727	85,030
Bunders ...	341,239	103,255	444,494	337,845	86,559	424,404
Total for Quarter ...	844,798	562,567	1,407,365	849,058	663,255	1,512,313
Total for year ...	3,168,671	2,271,870	5,440,541	3,140,795	2,176,727	5,317,522

Vessels other than ferry steamers, hired transports, Government vessels and country craft, which entered the Port of Bombay:—

Quarter ended March	1934-35 No.	1934-35 Net register tonnage.	1935-36 No.	1935-36 Net register tonnage.
Vessels engaged in foreign trade ...	220	1,027,136	239	1,067,817
Vessels engaged in coasting trade ...	704	628,481	727	635,338
Total for Quarter	924	1,655,617	966	1,703,155
Total for year ...	3,077	6,039,733	3,154	6,186,777

Port of Southampton Topics

Docks Statistics for May.

After four months of 1936 passing without a single decrease being recorded in the traffic dealt with at Southampton Docks the sequence has been broken. The May returns show that inward traffic generally was slacker than it was in May, 1935.

The number of vessels inward mounted from 272 to 282, and outward from 275 to 295, and the net tonnage showed increases of 542 tons inward and 98,096 tons outward. The tonnage figures were 907,283 tons inward, as compared with 906,741 tons, and 959,241 tons outward, as compared with 861,145 tons.

The gross tonnage outward was 1,775,853 tons, as against 1,591,542 tons, an increase of 184,311 tons, but the inward returns showed 7,643 tons less than in May, 1935, the figure being 1,667,259 tons, compared with 1,674,902 tons.

Cargo and passenger traffic showed decreases inward, but increases outward. Imports which amounted to 55,144 tons in May, 1935, were 45,606 tons in May this year, a decrease of 9,538 tons. On the other hand, exports mounted by 2,123 tons—from 32,165 tons to 34,288 tons.

Passengers arriving were 3,555 fewer than in May last year, the total being 18,621, as against 22,176. Those departing numbered 20,276, as compared with 17,893, an increase of 2,383.

The next few weeks will see the American "invasion" of Europe reaching its height. During that period all the big ships will be cutting their time in port between voyages to a minimum, and, generally speaking, little more than two days is allowed at either end between the termination of one voyage and the beginning of another.

Disastrous Fire in Banana Sheds.

Southampton's banana traffic, which has grown from very humble beginnings to astonishing proportions in the past four or five years, was seriously interrupted by a disastrous fire which burned down two specially-equipped sheds in the docks on June 5th.

The sheds had been specially adapted by the Southern Railway and equipped by Elders and Fyffes to deal with the port's banana traffic, which last year reached the large total of 2,348,992 bunches, compared with 274,249 bunches in 1931.

The flames destroyed the sheds along 250 yards of dock frontage and burned many of the special banana vans which were waiting to receive an incoming shipment. The damage was estimated at £75,000.

In order that the traffic shall not be interrupted longer than is necessary the clearing of the site has been pushed on rapidly and plans for the erection of new sheds are under way.

South African Fruit Trade.

The South African deciduous fruit season which terminated last month has been highly successful and the shipments dealt with at Southampton Docks up to the end of May reached the record figure of 4,200,000 packages or 800,000 packages in excess of the total handled during the preceding season. It is interesting to note that Southampton is the port of discharge for practically the whole of the Union's exports of fruit to the United Kingdom. This month will witness the arrival at the docks of large consignments of South African oranges, the citrus fruit season following closely upon the decline of the deciduous varieties. According to present arrangements the Union-Castle Mail Company at Southampton will handle three extra steamers with large fruit shipments during July in addition to the weekly mail liner arrivals from the Cape.

Seaborne Goods Traffic of Lower Weser Ports during March

Total goods turnover of the Lower Weser Ports in seaborne traffic during March, 1936, amounted to 639,936 tons, which was 46,537 tons less than traffic in February, 1936. The decrease was only in exports, which decreased by 70,490 tons to 369,943 tons, whereas imports increased from 246,060 tons in February to 269,993 tons in March, 1936. Exports were 32,483 tons lower and imports 31,811 tons higher than in March, 1935.

Seaborne goods traffic of the Bremen ports in March, 1936, at 515,193 tons, was 46,238 tons less than that of the previous month. This is also due to a considerable decrease in exports from 347,975 tons in February to 289,032 tons in March, 1936. On the other hand, imports rose during the same period from 213,456 tons to 226,161 tons. Compared with March, 1935, there is a decrease in exports by 53,961 tons and an increase in imports by 24,257 tons.

The decrease in seaborne exports of the Bremen ports during March, 1936, was chiefly due to a considerable fall in coal turnover. In addition, smaller quantities of coke, manures, spinning materials and cellulose were shipped. Shipments of raw iron also, after increasing considerably in the previous months, fell off. The total exportation of foodstuffs increased somewhat through larger shipments of wheat, but most of the other kinds of goods showed more or less considerable decreases.

Increased arrivals of fruit and tropical fruits, mill products, beverages, mineral oils and timber were the chief reason for the growth in imports in March, 1936, of the Bremen ports.

The Port of Colombo

Liquid Fuel Imports.

The quantity of liquid fuel imported at Colombo during April, 1936, amounted to 36,030 tons, as compared with 18,259 tons in April, 1935. During the first four months of 1936, 108,111 tons of liquid fuel were imported, as compared with 108,126 tons in the corresponding period of 1935.

Liquid Fuel Bunkers supplied to Steamers.

Liquid fuel bunkers supplied to steamers in April, 1936, was 37 ships bunkered with 18,503 tons of liquid fuel, as compared with 43 ships with 19,135 tons in April, 1935. For the first four months of 1936 the total number of ships bunkered was 178 with 84,748 tons of liquid fuel, as compared with 173 ships with 91,763 tons for the corresponding period of 1935.

Coal Imports.

The quantity of coal imported during the month of April, 1936, was 46,101 tons, as compared with 19,785 tons in April, 1935. Altogether 167,193 tons of coal were imported during the first four months of 1936, as compared with 130,134 tons in the corresponding period of 1935.

Coal Bunkers supplied to Steamers.

The number of steamers bunkered during April, 1936, was 60 with a total of 20,219 tons of coal, as compared with 87 steamers with 24,788 tons of coal in April, 1935. During the first four months of 1936, 274 steamers were bunkered with 81,460 tons of coal, as compared with 290 steamers with 84,468 tons of coal for the corresponding period of 1935.

Number and Tonnage of Vessels Entered and Cleared.

The number and tonnage of vessels other than country craft engaged in trade, which entered and cleared at the Port of Colombo during April, and the first four months of the year, is as follows:—

	Vessels engaged in Foreign Trade		Vessels engaged in Coasting Trade	
	No.	Tons	No.	Tons
(a) Entered during April, 1936 ...	233	1,066,274	2	6,821
,, ,, 1935 ...	240	1,086,064	4	9,303
,, ,, 1934 ...	221	989,154	3	8,019
During the four months ended April, 1936	890	4,151,906	21	55,978
During the four months ended April, 1935	911	4,166,618	13	34,849
During the four months ended April, 1934	882	4,067,408	16	47,459
(b) Cleared during April, 1936 ...	234	1,181,662	2	8,480
,, ,, ,, 1935 ...	244	1,090,637	1	4,059
,, ,, ,, 1934 ...	222	993,084	3	11,065
During the four months ended April, 1936	899	4,283,510	12	44,356
During the four months ended April, 1935	918	4,178,451	6	22,226
During the four months ended April, 1934	891	4,086,528	12	43,018

Tonnage of Imports and Exports.

The tonnage of imports and exports at the Port of Colombo during April, and the first four months of the year, is as follows:—

	During April		
	1934	1935	1936
	Tons	Tons	Tons
Imports (excluding Coal and Oil) ...	73,035	67,409	97,138
Exports (,, ,,) ...	62,627	37,524	46,229
Total	135,662	104,933	143,367

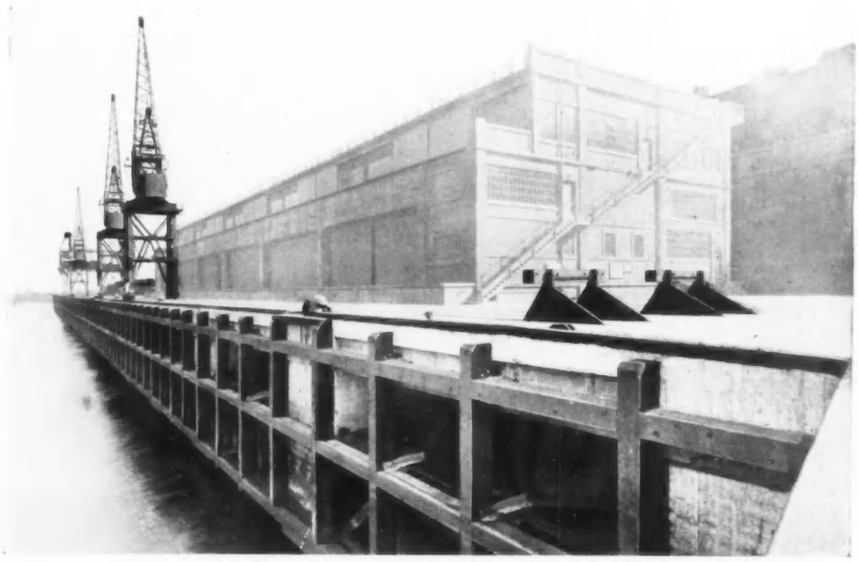
	During the four months ended April		
	1934	1935	1936
	Tons	Tons	Tons
Imports (excluding Coal and Oil) ...	338,475	339,103	375,106
Exports (,, ,,) ...	231,555	174,186	166,084
Total	570,030	513,289	541,190

Oil Facilities Receipts.

The oil facilities receipts for April, 1936, were Rs. 66,654, as compared with Rs. 113,221 during April, 1935. The total receipts for the first four months of 1936 were Rs. 335,461, as compared with Rs. 391,481 for the corresponding period of 1935.

DEEP WATER QUAY — SUNDERLAND

ENGINEER:
W. H. S. TRIPP, M.INST.C.E



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News from all Quarters

South Africa

ACCORDING to local opinions in Johannesburg one object of Mr. Pirow's visit to London is to discuss plans for making Capetown the largest base for British warships in the southern hemisphere. Full details of the scheme are not yet completed, but it is expected that it will cost 3½ millions pounds, which will be borne equally by the South African and the British Governments. It is claimed that the naval scheme was first decided upon about two years ago, when Admiral Sir Edward Evans was Commander-in-Chief of the African station. The Union was not then in a position to spend the money.

The alterations now being made to Capetown docks were at first considered as a scheme to make the docks more suitable for large ships, according to the report, but Capetown shipping could never warrant such large scale improvements. The enlargement of the docks was originally planned by the Capetown Council, but as soon as the plans were announced, Mr. Pirow interviewed a delegation from the Capetown City Council in Pretoria. It is alleged that Mr. Pirow was afraid that the Council's plans would interfere with the Union's greatest defensive scheme.

A large pier is now being completed on the site of the former pier, and will provide anchorage for four battleships the size of H.M.S. "Hood"—the largest in the world. At the end of the pier will be a graving dock which will be able to deal with warships of any size. A large tract of the foreshore will be reclaimed, and it is understood that five streets will be built on the reclaimed land.

Durban's new deep water quays are to be constructed by a novel and expeditious method. The old floating dock, which is more than thirty years old, and will shortly be replaced, instead of being scrapped, will be used as a floating platform from which to lay the blocks of the new quays. A similar method was followed at Capetown in the building of the deep water "D" berth, the former Durban dredger "Labrus" being used as a floating block layer. Plans for the conversion of the floating dock have not yet been completed. It is believed, however, that a number of cranes will be mounted on the dock and rails laid along its floor to supply the cranes with 15-ton blocks.

It is expected that the work will be carried out twice as fast in this way as it would if the usual plan were followed of using a single crane to build the wall foot by foot, travelling along the top of the newly-laid section. Owing to the urgent need for more deep water berths in Durban Harbour, this saving of time will be important.

Belgium

Previous to the dock strike the Antwerp harbour traffic was exhibiting considerable expansion. In May, compared with the same month last year, an increase was registered of 200,000 tons, or 13 per cent. This is especially striking in view of the fact that last year the Belgian franc had just been devalued, causing a jump in trade figures of 30 per cent. over those of May, 1934. This year each month has shown an increase so far over the corresponding month last year, at an average rate of 10 per cent. The tonnage for May has reached the record figure of 1,794,000 tons.

Finland

A report on harbour traffic in Finland was published recently in Helsingfors. The turnover in all Finnish ports together during 1935 aggregated something over 10½ million tons, imports amounting to 2,823,600 tons, and exports to 7,699,700 tons. The busiest port is Kotka, with a turnover of more than 1½ million tons, the next largest is Viborg (Viipuri) with rather under 1½ million, and Helsingfors is third on the list with a turnover of more than 1 million tons. Other large ports had the following turnovers: Abo 500,000, Kemi 435,000, Raumo 400,000, Björneborg 400,000, Vasa 384,000, the State's port Björkö 377,000 and Yxpila 340,000 tons. All other ports are below the 300,000 tons mark.

The premier import harbour of Finland is Helsingfors, the capital city, over whose port nearly 35 per cent. of the country's total imports by sea are landed. Other high figures are recorded for Kotka (14.6 per cent), Viborg (13.3 per cent.) and Abo (11.7 per cent.). Exports are more evenly distributed; only two ports show substantially higher figures than the rest, viz., Kotka and Viborg, by which 20.5 per cent. and 19.3 per cent. respectively of the total exports were shipped. Figures for most of the other ports are in the region of 4 to 5 per cent. The turnover was to a very great extent carried by Finnish vessels, which transported nearly 4 million tons, or about 37 per cent. of the combined total of imports and exports. Other nations participated in the trade in the following order:

	Per Cent.
German Vessels	16·6
Swedish Vessels	15·6
Danish Vessels	7·5
British Vessels	5·7

Sweden

The proposal of the Stockholm Harbour Administration for a new harbour base provides for a considerable reduction of the charges on goods. The most important changes proposed are that the unit for all charges will be "100 kilo," and that the former levy of 3 per cent. of the import duty will no longer apply. According to the new ruling the tax on goods will fall into three categories: Tariff I. is on imports, Tariff II. on goods from the Swedish harbours, and Tariff III. is concerned with exports. The charges are for the most part reduced, in the first category by 50 Ore, in the second by 20 Ore, and in the third by 5 Ore, per 100 kilo. For all goods which come in from the vicinity of Stockholm, charges are further reduced by 50 per cent. Finally, the proposal contains a statement that the charges will be calculated in accordance with the weight in British registered tons.

Holland

It was claimed in certain quarters that practically no advantage to the trade of Rotterdam has accrued from the Antwerp dock strike. But it has given rise to the view that the reduction of harbour dues is not by itself enough to enable the port to compete with Antwerp. The reduction of dock workers' wages is demanded in addition.

Rotterdam owes its world reputation as a port to the through-traffic passing mainly to and from Germany. For this reason the Germanophile *Telegraaf* advocates the winning back of Germany's patronage, and the following of a policy which has this aim in mind. It is also demanded that the hourly rate of the dockers must be approximated to the Antwerp tariffs. Wages were still about 100 per cent. above those at Antwerp, and this difference would have to be bridged at all costs. Finally, it is demanded that the freightage rates to and from Rotterdam must be adapted to the Belgian. It is pointed out that it is absurd that the freightage is higher for the Rhine shipping to its natural estuary harbour than for the inland shipping to Antwerp. The Government should, therefore, provide compensation for the Belgian bonus to Rhine shipping and should abolish the transit tax.

Jugoslavia

The figures referring to the number of ships using Jugoslavian harbours during April, 1936, have been announced.

Port	Ships	Capacity in 1,000 tons
Susak	327	114·6
Spalato	853	346·0
Sibenik	333	69·9
Dubrovnik	387	214·8
Zelenika	172	10·6
Other Ports ...	5,865	870·8
Total ...	7,937	1,626·7

Manchuria

The quay arrangements of the harbour of Dairen can no longer cope with the increasing traffic. This increase has been enormous over a period of years, but greatest of all since the founding by Japan of the State of Manchoukuo. In 1908 the total imports and exports of the port came to 720,000 tons; in 1931 to 6.7 million tons, and in 1935 to 8.9 million. Taking the present tonnage of Dairen as 100, that of Yokohama is 57.3, that of Osaka 53.1, and of Kobe 50.9. Growth of business is sure to continue in Dairen, so long as it remains a free harbour and forms the gateway of exports to Manchuria. The latter imported 273,092 tons from Dairen in April this year alone—an increase of 8,809 tons over last year. Extensions to the Korean harbours of Rashin, Seishin, and Yuki, will not restrict the trade of Dairen.

The South Manchurian Railway is preparing plans for extending the quays at which passengers are landed. As regards commercial trade, the increasing industrialisation of Manchoukuo will easily offset any competition from other far eastern ports.

Wellington Harbour Board, New Zealand

Annual Report for the Year ended September 30th, 1935

The Annual Report of the General Manager and Secretary for the year ending 30th September, 1935, was as follows:—

Trade of the Port.

The total trade of the Port has inceased by 117,685 tons, the figures being 1,758,459 tons, compared with 1,640,774 tons of the previous year.

Imports of all classes totalled 916,715 tons, an increase of 86,588 tons, or 10.4 per cent.; British and Foreign imports of all classes amounted to 441,150 tons, an increase of 56,741 tons, or 14.8 per cent.; Australian imports (102,050 tons) increased by 21,056 tons, or 26.0 per cent., and Coastal imports increased by 8,791 tons, or 2.4 per cent.

Transhipments to British and Foreign Ports totalled 58,435 tons, an increase of 6,978 tons, or 13.6 per cent.; Australian transhipments totalled 5,981 tons, or a decrease of 14.7 per cent., and Coastal transhipments decreased by 4.4 per cent., or by 5,724 tons.

Outward cargo of all classes totalled 464,296 tons, an increase of 30,645 tons, or 7.1 per cent., as against 433,651 tons last year. Exports to British and Foreign ports decreased by 6,985 tons, or 3.9 per cent. to 173,811 tons. Australian exports, which amounted to 42,619 tons, decreased by 5.6 per cent.; and Costal exports increased from 207,722 tons to 247,866 tons, or by 19.3 per cent.

The importations of timber (11,236,095 super feet) show an increase of 3,050,921 super feet. Timber exports decreased by 249,613 super feet.

Coal landed or transhipped (207,758 tons) decreased by 13,186 tons, or 6.0 per cent.; coal passing over wharves and paying wharfage amounted to 126,462 tons, a decrease of 2,657, or 2.1 per cent.; Government coal exempt from wharfage, decreased by 25.3 per cent., to 44,763 tons. Coal transhipped overside at wharves (36,533 tons) increased by 20.1 per cent.

The tonnage of oils in bulk pumped ashore shows a decrease of 17,881 tons, or 8.6 per cent. on last year's figures of 208,561 tons. Bulk oil outwards was 108,597 tons, a decrease of 685 tons this year. Bulk oils transhipped, mainly in fuel for bunkers, increased from 27,150 tons to 32,162 tons, or by 18.4 per cent.

There was a decrease of 16.6 per cent. in the quantities of wool and skins shipped this year, the total being 195,201 bales, of which 72,107 bales were pressed; wool transhipped decreased by 6,395 bales, or by 8.7 per cent.; and wool from shore and rail decreased by 32,511 bales, or by 20.2 per cent.

Hemp and tow shipments have decreased from 14,124 bales to 11,351 bales. Of this number 991 bales were pressed.

The total number of bales of wool, skins, hemp and tow, upon which the Board received storage during the year ended 30th September, 1935, amounted to 90,823 bales, or 43.9 per cent. of the total bales shipped.

Butter exports decreased from 23,375 tons to 22,672 tons, or by 3.0 per cent.

Cheese decreased from 46,718 tons to 43,173 tons, or by 7.6 per cent.; and frozen meat showed a decrease of 968 tons, or 1.8 per cent.

Shipping Arrivals.

The total net register tonnage of trading vessels entering the port during the year (excluding 112,257 tons representing warships, lighters, private yachts, etc.) amounted to 3,790,436 tons, which is 137,326 tons greater than last year. For comparison with those ports combining the arrivals and departures, the total net register tonnage of trading vessels that arrived and departed from and to overseas and coastal ports during the year was 7,372,312 tons.

Cargo Handling.

The gross cost of labour, both permanent and casual, employed on handling cargo shows an increase on the previous year's figures.

The cargo claims paid during the past year amounted to £94 13s. 3d., as compared with £39 10s. 11d., £73 8s. 11d., and £84 17s. 1d. in the three preceding years. The analysis for the year is as follows: breakages, 31 claims, £82 7s. 4d.; goods short delivered, 2 claims, £8 6s. 1d.; cost of adjusting errors in delivery, 1 claim, £4 5s. 5d.; total 34 claims, £94 13s. 3d.

The total amount of cargo handled by the tractors was 273,786 tons.

The quantity of cheese and fruit handled in the Board's cool store amounted to 30,066 tons.

Export Values.

The total value of all overseas exports from the Port of Wellington for the year ended 30th September, 1935, was, from the H.M. Customs returns, £12,035,472 (including £1,763,600 specie), compared with £12,332,162 last year, a decrease of £296,690.

The principal exports were:—

	£
Frozen Meat	2,497,937
Cheese	1,845,824
Wool	7,791,611
Butter	1,605,283
Gold Bullion	467,112
Apples	328,402
Skins	319,416
Sausage Casings	293,064
Hides	192,332
Tallow	167,175
Casein	88,771
Seeds	54,851
Live Stock	53,743
Pears	42,934
Fish	37,773
Hemp and Tow	30,036
Grain	25,735
Other Exports, including Specie	2,193,473

Import Values.

The total values of all imports, including specie, computed in N.Z. currency, during the year ended 30th September, 1935, was £13,285,660, compared with £10,522,065 for the previous year, an increase of £2,763,595.

From H.M. Customs return the imports were shown as derived from the following countries:—

	£
United Kingdom	6,894,500
United States of America	2,091,645
Australia	1,521,824
Canada	951,696
Japan	419,181
Dutch East Indies	298,730
Germany	187,120
Ceylon	143,691
Sweden	99,687
France	77,535
India	76,506
Italy	52,225
Belgium	49,247
Netherlands	40,104
Other Imports	381,969

The total value of New Zealand imports during the year ended 30th September, 1935, was £35,865,715, and of exports £45,402,851, so that 37 per cent. of the total imports and 26.5 per cent. of the total exports passed through the Port of Wellington.

Financial Results.

The income and expenditure shows that the receipts for the year were £397,362 14s. 1d., an increase of £30,184 0s. 4d., and the expenditure £394,826 7s. 9d., an increase of £37,692 13s. 7d. The balance on the year's working was £2,536 6s. 4d., compared with £10,044 19s. 7d. last year.

The principal increases in revenue were in wharfage on general cargo, harbour improvement rate and berthage.

The total assets of the Board are now £3,126,249 1s. 2d., and the liabilities £1,263,909 8s. 0d., the balance of assets over liabilities being £1,862,339 13s. 2d., an increase of £55,087 6s. 0d. This is made up principally by increases in Sinking Funds amounting to £35,369 17s. 11d., in Special Funds amounting to £17,181 1s. 9d., and the balance of the year's working of £2,536 6s. 4d.

The Board's debt liability remains the same, namely, £1,250,000, against which there are now sinking funds amounting to £677,458 7s. 10d., leaving a net indebtedness of £572,541 12s. 2d.

Port of Rangoon: Approach Channels

The Commissioners of the Port of Rangoon have recently had under review their policy with regard to the maintenance of the approach channels to the Port of Rangoon used by seagoing ships, and they consider it desirable that their decisions on the subject should be made known to all users of the port. The following is a brief statement of the position, but the Commissioners will welcome inquiries from anyone who may be interested, and specific questions of detail will be answered on application to the Secretary, Post Box No. 85, Rangoon, Burma.

The Rangoon River, on which the Port of Rangoon is situated, forms the most easterly outlet of the River Irrawaddy. On both its flanks, at its embouchure into the Gulf of Martaban, there are extensive alluvial deposits which stretch for miles into the Gulf in the form of a submerged declining plane. The crest of this plane constitutes what has come to be known as the Outer Bar of the Rangoon River.

As a result of the natural seaward growth of the Irrawaddy Delta, the navigable channels over the Bar had been gradually deteriorating for some considerable time, but it was not until recent years that the Bar began to exert a limiting influence on the draft of vessels and to assume paramount importance in the conservancy problems of the port. After local engineering and hydrographical surveys had been carried out, the Commissioners placed the matter before their Consulting Engineers, Sir Alexander Gibb and Partners, of Westminster, on whose advice they decided to construct in London a tidal model of the Rangoon River. The purpose of the model was, in the main, to ascertain the probable future tendencies in the development or deterioration of the Outer Bar and to investigate the effect of possible remedial measures. Experiments with the model commenced in the autumn of 1932 and were concluded in the summer of 1935; the final report of the Consulting Engineers on the results of their investigations was placed before the Commissioners in April, 1936.

In regard to the probable future regime of the Outer Bar, the main conclusion reached was that conditions would never be materially worse than in the year 1931 and that, even under the worst conditions, the port would always be accessible without serious difficulty to vessels of the size generally using it at present, with one or two exceptions. Various remedial measures were tested on the model and an important conclusion reached was that training works were completely ineffectual in maintaining a suitable channel over the Outer Bar. Dredging operations on the other hand met with some measure of success on the model; it was shown that a dredged cut, properly positioned in relation to the direction of the tidal currents, maintained and, in certain circumstances, improved itself. A reservation was, however, made in the report that no model could satisfactorily demonstrate the practicability of dredging under the conditions existing on the Outer Bar in Rangoon, and with the materials to be dealt with in that area.

Particular attention was therefore directed, when the Consulting Engineers' report came before the Commissioners, to the question of dredging over the Outer Bar. In its physical aspect, the Commissioners doubted whether it was practicable to carry out, under the conditions existing over the Outer Bar, a dredging programme of sufficient magnitude to be efficacious in securing a greater depth of water. In fact the information before them rather tended in the opposite direction.

On the assumption, however, that channels could thus be deepened to suit vessels of deeper draft, consideration was given to the financial implications of a dredging scheme and to the policy by which the Commissioners were to be guided in this regard. It was clear to them, assuming that the Rangoon River was likely to remain for a considerable time a natural channel of approach for vessels drawing up to 28 ft., that any programme of dredging would benefit only a comparatively small percentage of the vessels which now use the port. The question was therefore whether there was sufficient justification for embarking upon a programme of dredging involving a considerable burden upon port funds, which would have to be borne not only by the comparatively small number in whose interests the improvements would be carried out, but also by the large majority who would not be affected by any increase in the available depth of water, as well as by general users of the port.

It was greatly doubted whether the users of the port as a whole would be willing to accept any appreciable increase in charges for the sake of a comparatively small proportion of their number, and it was thought that among those who would object might conceivably be included some of those who would themselves be benefitted by an increase in navigable depth. The Commissioners realised that there is a point in port development at which economical considerations must impose a limit upon the draft of shipping, and that the prosperity of this port might be prejudiced just as much by heavy charges as by physical obstructions. They decided, therefore, not to proceed with major dredging operations over the Outer Bar.

This decision will undoubtedly mean that the existing difficulties can only be overcome, not by any attempt on the part of the Commissioners to adapt the port to the needs of deeper draft vessels, but by the realisation on the part of ship owners that the port cannot deal expeditiously with vessels drawing more than about 28 ft. of water, and by the formulation of future ship building programmes upon this basis. It is thought that ship owners will agree that it is more satisfactory that they should now have before them, as a foundation for their own policy, an official statement of the Commissioners' considered views on this question of the depths available over the Outer Bar. The situation will, of course, be carefully watched and there will be no relaxation in the present systematic and unremitting observations of the approach channels, but the Commissioners entertain the hope that the future will bear out the main conclusion indicated by the Tidal Model investigations, namely, that the Rangoon River and its approaches are likely to remain for a considerable period a safe and natural channel of approach for vessels of the draft now using the port.

Port of London Notes

London's Shipping.

During the week ended 29th May, 1,044 vessels, representing 1,107,916 net register tons, used the Port of London. Of these 552 vessels (891,043 net register tons) were to and from Empire and foreign ports and 492 vessels (216,873 net register tons) were engaged in coastwise traffic.

* * * *

During the week ended 5th June, 936 vessels, representing 977,897 net register tons, used the Port of London. Of these 484 vessels (801,075 net register tons) were to and from Empire and foreign ports and 452 vessels (176,822 net register tons) were engaged in coastwise traffic.

* * * *

During the week ended 12th June, 1,325 vessels, representing 1,133,037 net register tons, used the Port of London. Of these 522 vessels (883,611 net register tons) were to and from Empire and foreign ports and 803 vessels (249,426 net register tons) were engaged in coastwise traffic.

* * * *

During the week ended 19th June, 968 vessels, representing 988,979 net register tons, used the Port of London. Of these, 528 vessels (779,349 net register tons) were to and from Empire and foreign ports, and 440 vessels (209,630 net register tons) were engaged in coastwise traffic.

Satisfactory Trade Results at Liverpool.

An analysis of the figures respecting Liverpool's trade for the month of May discloses some interesting and satisfactory results. Compared with the same month last year 12 more vessels were handled at the Liverpool docks representing an increased tonnage of 98,821. Foreign and coastwise vessels paying dock tonnage and harbour rates for the period July, 1935, to May, 1936, number 17,307, an increase of 1,084 ships over the corresponding period 1934/35.

It is worthy of note also that there have been increases during the month in the imports of grain, flour, fruit and cotton. Exports are equally satisfactory, most of the lighter industries in the Midlands continuing to make steady progress, the tube trade being exceptionally busy. Engineering firms in Nottingham and Leicester and car manufacturers in Coventry have large orders on hand for shipment to the Dominions.

The Dock Board have shown considerable enterprise by providing exceptional facilities both at Liverpool and Birkenhead and the spirited manner in which these advantages are made known to Dominion and foreign visitors can only lead to increasing and diversified business. There is every indication that the port's trade with the Empire will show an increase in the future, and not the least, it is hoped, will be an expansion in the trade with Australia. At the conclusion of his tour recently the Premier of New South Wales said that the equipment of the Mersey Docks was the most modern he had seen and he would return to his country with a greater appreciation of the important centres of population which the port serves.

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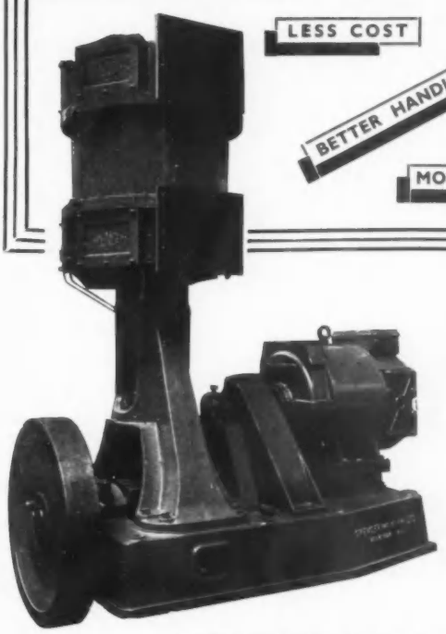

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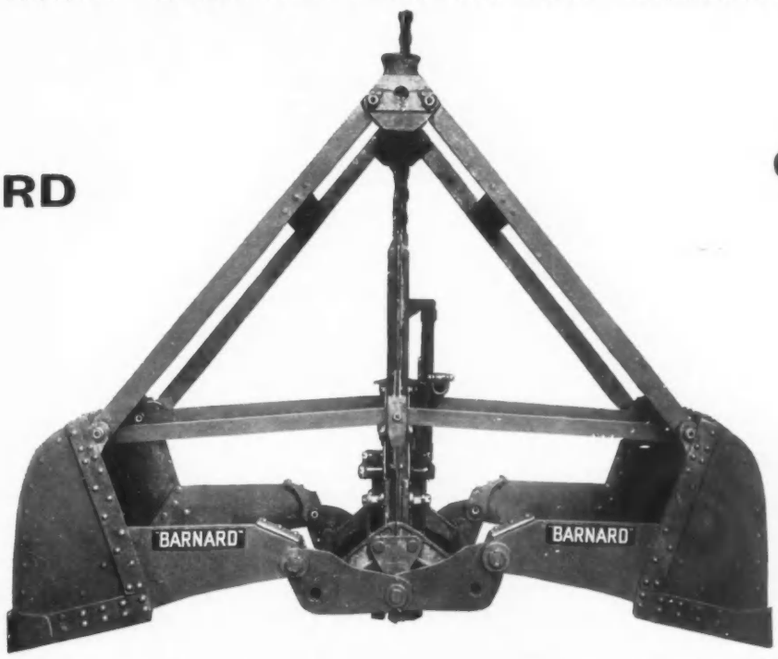

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Hull and the East Coast

Extension of St. Andrew's Dock.

IN connection with the projected extension of the St. Andrew's Dock at Hull at an estimated expenditure of £750,000, the London & North-Eastern Railway directors have intimated that it is expected that contracts for the work will be let towards the end of the present year. In amplification of the details already made public, it is stated that five new slipways will be provided, and that there will be a new bridge connecting the St. Andrew's Dock Estate with West Dock Street. The bridge will be carried over the old Hull and Barnsley railway, which is to be slightly diverted. The dock is used exclusively by the fishing industry, and the extension of the water area by five acres bringing the total up to nearly 25 acres, together with new quays and landing facilities, will go some way towards meeting the very pressing requirements of an industry which, in recent years, has made phenomenal progress.

Major W. H. Carver, M.P., a director of the London & North-Eastern Railway, at a recent meeting of the Hull Chamber of Commerce and Shipping, stated that the Company could not resist the claims of the fishing industry which through "all these years of difficulty" had gone from strength to strength, and that the continued growth of the landings of fish at St. Andrew's Dock merited some extension of dock space. The scheme of improvements has been very cordially welcomed by steam trawler owners and others, who look forward with confidence to still further expansion of the industry.

Meeting of Humber District Association of Chartered Shipbrokers.

At the meeting of the Humber District Association of Chartered Shipbrokers, Mr. T. H. Stone, moving the adoption of the report, made reference to the urgent need for extended berthing accommodation at the Victoria Dock, Hull, said that shipowners, importers and others were continually hammering at the Dock Authority to provide better facilities, and were determined to obtain some improvement in order to avoid, or at any rate to minimise the recurring delays which took place, particularly at Victoria Dock, during the peak of the Baltic timber-importing season. He earnestly appealed to the Dock Authorities to do something, for it was, he remarked, vital to the welfare of the timber trade and the port generally.

Touching upon dry-dock charges at Hull, Mr. Stone suggested that if the dock owners would make a reduction in the dues, they would encourage more vessels to come to Hull, and a fuller and more regular use of the dry docks. This would be beneficial, not only to them, but the general trade of the port.

Referring to the coal trade, Mr. Stone remarked that the Humber was rapidly drifting into a hopeless condition, so far as exporting and bunkering were concerned. The excellent appliances provided at Hull, Grimsby, Immingham and Goole for this, at one time, most promising trade, when they were shipping 14 and 15 million tons of coal per annum, were to a large extent simply rusting away in idleness. The position was most serious for the Humber ports, for markets abroad were being rapidly lost to Continental competitors, some never to be regained. It had been, he added, a sorry and deplorable spectacle to see steamers ordered from the Humber (an important exporting and bunkering centre) to Continental ports for supplies. The colliery owners had their difficulties, he knew, but he expressed the view that what was possible in the flourishing days gone by ought to be possible to-day if they could only have a return to enterprise and individuality on which a big trade was built up. Matters had gone from bad to worse since the coal industry had been shackled and hampered with restrictions.

Dealing with conditions at the docks, Mr. W. Fenton, at the same meeting, said that in the past year work had proceeded smoothly with perhaps one or two small exceptions, and nearly all the boats had been given good despatch, apart from the timber trade. In regard to the latter congestion had been not quite so bad. The Shipping Committee, who had been appealing for better facilities for 14 years past, had at last made some progress and had got the timber importers and the railway company, the owners of the docks, to realise that it was necessary for alterations to be made. Owing to the delays, shipowners were asking from 1s. to 3s. per standard more for vessels coming to Hull to discharge than they did for London or Grimsby. The position was that the cargoes coming to hand in the season were rather more than the Victoria Dock could deal with, but he was glad to say that the railway company had prepared a scheme and taken estimates of cost. If that scheme of improvement came to fruition, Hull would be able to regain its old position as the most important timber-importing centre of the United Kingdom.

Visit to the Port of Goole.

Members of the Yorkshire Coal Exchange have recently, on the invitation of the directors of the Aire & Calder Navigation, visited the Port of Goole, the object being to inspect an improved appliance designed to prevent the undue breakage of coal in loading. In November, 1934, the Navigation installed at No. 5 hoist in South Dock a Mitchell anti-coal breaker, and coal exporters and their customers overseas have been highly satisfied with its operation. The effect has been a substantial reduction in breakages, but a still higher degree of efficiency has been sought for, and as the result of experience gained during the past 18 months, an improved apparatus has now been provided at No. 3 hoist in the Aldam Dock. This new apparatus does away with the shoot which formed part of the original equipment, and substitutes a hopper and conveyor belt through and over which the coal passes on its way from the Compartment boat, in which it is brought down the Navigation to the hold of the ship on which it is to be exported. No other plant of this type, it is stated, exists. It is claimed for it that by its use the handling of coal is greatly facilitated, both in loading and trimming, and that the results so far achieved have given unqualified satisfaction to shippers and port officials. Last year the Aire & Calder Navigation transported in their unique compartment boats (floating wagons) from the collieries to Goole for shipment abroad 689,000 tons of coal equal to 42 per cent. of the total foreign exports from Goole. The party steamed down the Navigation from Whitley Bridge on s.s. "River King," on which they were entertained to luncheon and cordially welcomed by Sir John Eaglesome, managing director of the Aire & Calder Navigation. The guests included the Mayor of Goole (Mr. T. E. Kettlewell), the Deputy-Mayor (Mr. E. Johnson), the Chairman of the Yorkshire Coal Exchange, Leeds (Mr. J. H. M. Humble), Mr. Kenneth Hargreaves and Mr. Harry Hargreaves (Thos. Hargreaves & Sons), Mr. F. C. Mitchell (Mitchell Engineering Co., Ltd.), and Capt. G. E. Lea (Dock & Harbourmaster, Goole). Mr. Humble, in returning thanks for the hospitality, said that those interested in the coal trade of Yorkshire were fortunate in being able to avail themselves of the economical and efficient means of transport provided by the Aire & Calder Navigation. Sir John Eaglesome, he added, was a pioneer in seeking the highest degree of efficiency, and the coal trade owed him a great debt of gratitude.

Humber Bridge Scheme.

At a recent meeting of the Humber Conservancy Board it was reported that the Board of Trade had been approached with a request that they should use their good offices to ensure that the Humber Bridge Scheme should be submitted to the Conservancy Board in ample time, and that the Board of Trade had requested the Ministry of Transport to consult with them as soon as the scheme was submitted to them. The Board of Trade stated that in due course the Conservancy would have the opportunity of submitting to them any representations they might desire to offer. There have been no fresh developments in regard to the project, the details and plans concerning which are still in course of preparation.

Dredging of Bridlington Harbour.

The Bridlington (East Yorkshire) Harbour Commissioners have approached the Bridlington Corporation with a view to a grant of £400 during the present financial year towards the cost of dredging the harbour instead of a grant of £200 in respect of the current year and a similar sum in respect of the succeeding financial year. The Corporation, through the Finance Committee, have in reply intimated that they are unable to accede to the request, but that arrangements will be made for the grant in respect of the current financial year to be paid immediately, and the grant in respect of the next financial year to be paid at the beginning of May, 1937. The Bridlington Corporation have adopted further recommendations in connection with the proposed new road on the land side of the harbour, to provide a direct means of access between the north and south portions of the town. The present recommendations deal with the culverting of the back and the filling-in of Clough Hole to the eastern end of the wooden jetty. The work is to be proceeded with as the first portion of the scheme, subject to a grant being obtained towards the cost.

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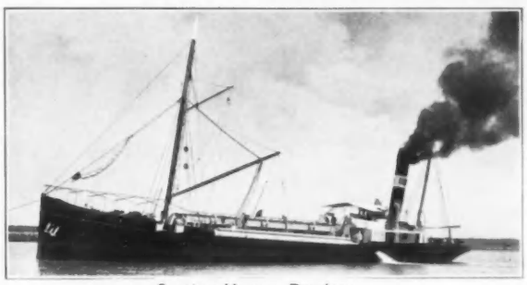

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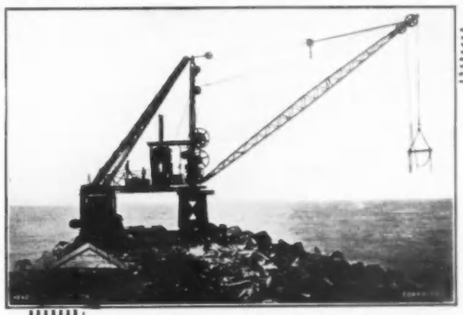

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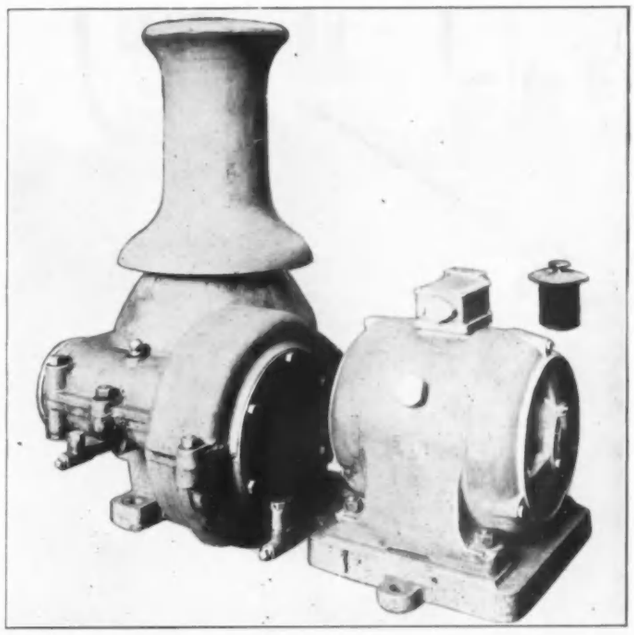

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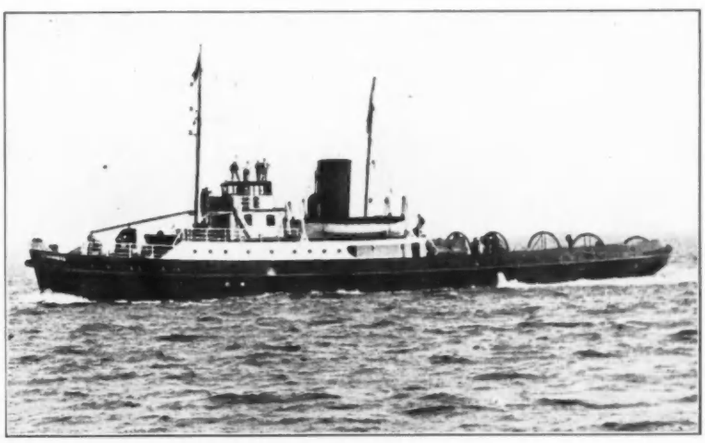

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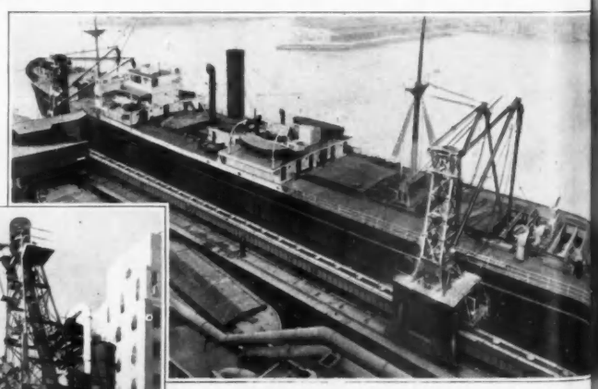
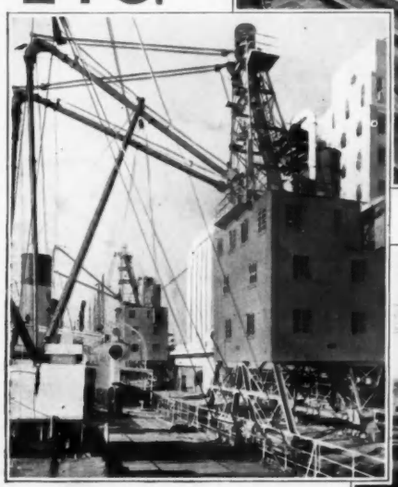
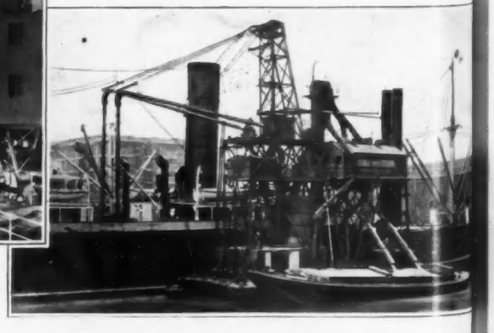


"Simon" Patent Pneumatic Grain Handling Plant at Millennium Mill, Victoria Dock.





Above. "Simon" Pneumatic Plant at Avonmouth (Spillers Ltd.)

Right. Floating Pneumatic Plant "Thomas Wiles" at the Port of London.

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